HISTORY *of* MANUAL *and* INDUSTRIAL EDUCATION *up to* 1870

BENNETT

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By

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THE MANUAL ARTS PRESS
Peoria, Illinois

Printed in the United States of America

PREFACE

THE preparation of this volume was undertaken on account of the difficulties encountered through many years in trying to help students to build up in their own minds an adequate historical background of the present development in manual and industrial education, and because of my conviction that such a background is essential to an adequate understanding of the present-day problems of public education.

In selecting the material for such a background, however, no attempt has been made to give all the facts that might be included, nor has an effort been made to support any particular theory or system of education. No conscious effort has been made to emphasize or even, in most cases, to indicate the relationship between the past and the present. Preaching has been intentionally avoided. In general, the aim has been to give facts and the opinions of selected writers in an organized form, hoping that the reader will make his own use of them.

In selecting the material I have tried to draw from the best available sources. In nearly every case these have been from the earliest. Whenever possible, original sources, or translations from them, were preferred. A particular effort was made in quoting from early writers to give enough in each case to adequately present the author's ideas, and not merely to take isolated passages which are liable to wrong interpretations.

In order to accomplish this and to give the reader something of the atmosphere of the times, rather extensive selections of source material have been added to several of the chapters. These, I believe, will give helpful information though some of them may be of only secondary importance. Perhaps no apology need be made for printing this source material in its original form—sometimes with quaint spellings and strange punctuations. I have thought that it would serve its purpose best in the old form.

If every person who has assisted me in gathering the material for this volume were to be named, the list would be a long one and would include former students, associates in teaching at Bradley Polytechnic Institute, numerous employes in reference libraries, the proprietors of old book stores, and certainly the members of my own family who have not only endured but have encouraged and assisted me through the years of collecting material and writing. Special acknowledgment, however, should be made of the exceptional service rendered by the officials of the Peoria Public Library and of special privileges at the library at the University of Wisconsin, at the Harper Memorial Library of the University of Chicago, the Newberry Library, Chicago, the John Crerar Library, Chicago, the library at the Illinois State Normal University, and the one at the United States Bureau of Education in Washington. For reading and translating parts of several French and German reports and books, I am indebted to my son, Professor Howard G. Bennett, of the University of Vermont. For reading the first five chapters in their original form and for encouragement and helpful suggestions, I am much indebted to Professor Paul Monroe of Teachers College, Columbia University, and to Professor A. C. Newell of Illinois State Normal University.

CHARLES A. BENNETT.

Peoria, Illinois
April, 1926

CONTENTS

PAGE

PREFACE 3

ILLUSTRATIONS 9

CHAPTER I. LABOR AND LEARNING BEFORE THE RENAISSANCE 11

1. Appreciation of the value of hand skill to the individual. 2. The savage learns handwork by unconscious imitation. 3. Barbaric peoples learn manual arts through conscious imitation. 4. Social value of handwork emphasized by the ancient Jews. 5. Labor a religious duty among the Jews. 6. Attitude of the Greeks toward mechanical arts. 7. Labor a fetish among early Christian monks. 8. Manual labor required by the Benedictines. 9. The useful arts developed by the Benedictines. 10. Curriculum of the monastic schools. 11. Apprenticeship in the crafts. Source material: I, A—All these trust in their hands. I, B—Extracts from the rule of St. Benedict. I, C—Apprenticeship in the Middle Ages. I, D—Apprenticeship as education. Source references.

CHAPTER II. THE RELATIONSHIP BETWEEN THINGS AND THOUGHTS 30

12. A new conception of the process of education. 13. Luther advocated a state-supported, comprehensive education for all children. 14. Rabelais would approach knowledge through the use of objects and the observation of processes. 15. Mulcaster makes drawing one of the fundamental studies. 16. Bacon's philosophy of realism. 17. Comenius advocates teaching according to the order of nature and the arts. 18. Progressive educational thinking in England. 19. The earliest plan for a college of agriculture in England. 20. A "literary workshouse" suggested by Petty. 21. The aims of the Royal Society of London. 22. Moxon's treatise on mechanical processes. 23. John Locke includes the manual arts in his scheme of education. 24. Thomas Budd's plan for public schools in America. Source material: II, A—The method of the arts by Comenius. II, B—Locke's estimate of the manual arts. Source references.

CHAPTER III. HAND TRAINING A MEANS OF MENTAL TRAINING 72

25. Practical experiments grow out of theoretical discussions. 26. The Francke institute and its influence. 27. Rousseau and his new system of education. 28. Basedow and his

PAGE

efforts to apply the principles of Rousseau. 29. Other early efforts to apply the principles of Rousseau. 30. Schools of industry. 31. Industrial instruction in America. Source material: III, A—Rousseau's estimate of the value of the manual arts in education. III, B—A "Rural Academy." Source references.

CHAPTER IV. HANDWORK A FUNDAMENTAL MEANS IN EDUCATION 106

32. Pestalozzi and his preparation for his life work. 33. The Neuhof industrial school experiment. 34. Pestalozzi finds another opportunity to help poor children. 35. Pestalozzian methods. Source material: IV, A—The Pestalozzian method of teaching drawing as told by Johannes Buss. IV, B—Pestalozzi's discussion of measuring in its relation to teaching drawing. Source references.

CHAPTER V. THE FELLENBERG INSTITUTION AT HOFWYL 128

36. Fellenberg's theory of society. 37. Establishment of the educational institution at Hofwyl. 38. Fellenberg's academy. 39. Fellenberg's farm and trade school. 40. Fellenberg's school for girls. 41. Fellenberg's school of applied science. 42. Fellenberg's normal school. 43. Fellenberg's school colony at Meykirch. Source material: V, A—Fellenberg and his school. V, B—Fellenberg's school. V, C—A former student's account of Hofwyl. Source references.

CHAPTER VI. THE FOLLOWERS OF PESTALOZZI AND FELLENBERG 157

44. Popular interest in the work of Pestalozzi and Fellenberg. 45. Heusinger the forerunner of Froebel. 46. The prophetic vision of Niemeyer. 47. Herbart's view of manual arts. 48. Froebel and his doctrine of self-activity. 49. Wehrli's normal school at Kreuitzlingen. 50. The Wehrli agricultural schools. 51. Oberlin and the first infant school. 52. Robert Owen and his school at New Lanark. 53. The New Harmony educational experiment. 54. Bronson Alcott's Temple School in Boston. 55. The Manual Labor Movement in America. Source material: VI, A—Wehrli's normal school at Kreuitzlingen. VI, B—Origin and management of Oneida Institute of Science and Industry. VI, C—Labor and study at the Manual Labor Academy of Pennsylvania. VI, D—A manual labor department of an academy. Source references.

CHAPTER VII. INDUSTRIAL SCHOOLS FOR POOR OR DELINQUENT CHILDREN 210

56. Industrial schools for orphans in Germany. 57. Schools for orphans in Great Britain. 58. Industrial reform school. 59. The ragged schools of England and Scotland. 60. "Certified industrial schools" in England. 61. Industrial work

PAGE

in English elementary schools for the poor. 62. Drawing and industrial work in German elementary schools. 63. Industrial schools for orphans and poor children in America. 64. Industrial reform schools in America. Source material: VII, A—Establishment of pauper schools. VII, B—Needlework as reported by government inspectors of schools in England. VII, C—On girls' industrial training. VII, D—The education of factory children in Germany. VII, E—Education of the working classes in Europe. Source references.

CHAPTER VIII. THE DEVELOPMENT OF SCHOOL SUBSTITUTES FOR APPRENTICESHIP 266

65. Apprenticeship and schooling. 66. The education of apprentices in Colonial America. 67. The factory system and its effect upon apprenticeship. 68. English half-time schools. 69. Seeking a substitute for apprenticeship in France. 70. The beginnings of the National Schools of Arts and Trades in France. 71. Findings and recommendations of the French Commission of 1865 concerning child labor in factories. 72. Value of special instruction shops in apprentice training. 73. Value of the school workshop in technical training. 74. General educational value of shopwork recognized in France. 75. Drawing in French schools for industrial training. 76. Child labor regulations in Germany. 77. Continuation schools of Germany. 78. Shopwork instruction in German schools. 79. Drawing instruction in Germany. Source material: VIII, A—British half-time schools as reported by government inspectors of schools in England. VIII, B—Advantages of the half-time schools. VIII, C—The technical school at Mulhouse. Source references.

CHAPTER IX. THE MECHANICS' INSTITUTE MOVEMENT 301

80. The mechanics' institute movement in Great Britain. 81. The workingmen's colleges in England. 82. Mechanics' institutes in America. 83. The Lyceum Movement. Source material: IX, A—Early days of the mechanics' institutes in England. IX, B—Some results of the mechanics' institutes in England. IX, C—Aims and results of the mechanics' institutes in England. IX, D—The spirit of Working Men's College. IX, E—American Lyceum of Science and the Arts. Source references.

CHAPTER X. HIGHER TECHNICAL EDUCATION IN RELATION TO INSTRUCTION IN THE MANUAL ARTS . . 345

84. Higher technical schools of France. 85. Higher technical schools in other European countries. 86. Early American schools of applied science and engineering. 87. The Land-Grant Act of 1862. 88. The workshop in the School of Engineering. Source material: X, A—The Gardiner Lyceum. X, B—A state university for the industrial classes. Source references.

PAGE

CHAPTER XI. THE DEVELOPMENT OF ART EDUCATION IN RELATION TO INDUSTRY 374

89. Early art schools in Italy. 90. The progressive policy of France in developing art instruction. 91. Early schools of art in Great Britain. 92. The establishment of the British system of industrial art training. 93. Art instruction in Germany and other European countries. 94. Early art development in Philadelphia. 95. The struggle for the recognition of art in New York City. 96. Art and art instruction in Boston. 97. Art instruction in other American cities. 98. Early courses in drawing for general education. 99. Drawing in Boston public schools before 1870. 100. Early efforts to establish drawing in public schools of Philadelphia and Baltimore. 101. The beginnings of public school drawing in Ohio. Source material: XI, A—Value of instruction in drawing. Source references.

LIST OF ILLUSTRATIONS

		PAGE
Fig. 1.	Sir William Petty's Pamphlet on the *Advancement of Learning*	44
Fig. 2.	A Paragraph by Petty on the Art of Drawing	45
Fig. 3.	Title Page and Frontispiece of Sprat's *History of the Royal Society of London*	49
Fig. 4.	First page of the dedication and Initial page of first part of Sprat's history	50
Fig. 5.	Title page, Moxon's *Mechanick Exercises*	52
Fig. 6.	Tools of Smithing, Moxon's *Mechanick Exercises*	53
Fig. 7.	Initial page on Smithing, Moxon's *Mechanick Exercises*	54
Fig. 8.	Tools used in Joinery, Moxon's *Mechanick Exercises*	55
Fig. 9.	Preface to Moxon's *Mechanick Exercises*	56
Fig. 10.	Preface to Moxon's *Mechanick Exercises*	57
Fig. 11.	Preface to Moxon's *Mechanick Exercises*	58
Fig. 12.	Preface to Moxon's *Mechanick Exercises*	59
Fig. 13.	Jean Jacques Rousseau	77
Fig. 14.	John Henry Pestalozzi	106
Fig. 15.	Pestalozzi's Home at Neuhof	110
Fig. 16.	Pestalozzi at Stanz	117
Fig. 17.	Alphabet of Form	120
Fig. 18.	Central Group of Buildings at Hofwyl	130
Fig. 19.	Plan of Hofwyl	133
Fig. 20.	School Colony at Meykirch	145
Fig. 21.	Daily Program of Classes in Wehrli's Normal School in 1839	168
Fig. 22.	New Harmony as it was during the Owen Occupation	175
Fig. 23.	Plan of Red Hill Farm School	221
Fig. 24.	Carpentering Class in a Ragged School	227
Fig. 25.	Sewing Class in a Ragged School	228
Fig. 26.	Number of Voluntary Teachers in the Schools of the Ragged School Union, 1845 to 1905	229
Fig. 27.	One of the first statements sent out by the London Mechanics' Institute. 1823	305
Fig. 28.	Frederick Denison Maurice	311
Fig. 29.	The Franklin Institute, Philadelphia, 1825	323
Fig. 30.	Holbrook's Original Plan	326
Fig. 31.	Somerset Palace, The Strand, 1837	382
Fig. 32.	Catalogue of Exhibition of Boston Athenæum, 1828	405
Fig. 33.	Plate V. From Smith's *Juvenile Drawing Book*. 1822	411
Fig. 34.	Plate XI. From Smith's *Juvenile Drawing Book*. 1822	412
Fig. 35.	Plate XIII. From Smith's *Juvenile Drawing Book*. 1822	413

PAGE
Fig. 36. Plate XV. From Smith's *Juvenile Drawing Book.* 1822 . . 414
Fig. 37. Course in Geometric Drawing. From Fowle: *The Hand and Eye* 417
Fig. 38. Plate illustrating principles of perspective. From Fowle: *The Hand and Eye* 418
Fig. 39. Interior view of Bronson Alcott's schoolroom in Boston . . 420
Fig. 40. Plate in Bartholomew's *National System of Industrial Drawing,* Book 6 423
Fig. 41. A Page, Teacher's Hand Book Number 2, Bartholomew's *National System of Industrial Drawing* 424
Fig. 42. Study of the Elements of Landscape by Bartholomew . . . 425
Fig. 43. Outdoor Study by Bartholomew 426
Fig. 44. Landscape by Bartholomew 427
Fig. 45. Landscape by Bartholomew 428
Fig. 46. Landscape by Bartholomew 429
Fig. 47. Development of Solids. From Minifie's *Textbook of Geometrical Drawing* 434
Fig. 48. Isometric Figures. From Minifie's *Textbook of Geometrical Drawing* 435

REFERENCE NUMBERS

Throughout this volume the reference numbers refer to the Source References at the ends of the chapters. The first number in the parenthesis is the number of the reference in the list. The last number is the page in the book referred to. In some cases more than one page is indicated; in others none is indicated. When the book consists of more than one volume the volume number is indicated in Roman numerals and is placed immediately before the page number. In a few cases page numbers are in Roman numerals because they refer to introductions to books and these are often printed in Roman numerals. Source material numbers refer to the excerpts printed at the ends of the chapters. In these references the Roman numeral indicates the chapter in this volume.—Author.

CHAPTER I

Labor and Learning Before the Renaissance

1. **Appreciation of the Value of Hand Skill to the Individual.** Rousseau is said to have warned the young men of wealth in France by saying: "A revolution is approaching, and the man who has a good trade will be well taken care of." In making this statement he recognized that skill of hand is an asset to any man, and especially when fame and fortune have been swept away. A trade involving skill of hand is a safeguard against personal want and poverty. Many of the manual trades are very close to the primary necessities of life. This idea has long prevailed among the royal families of Europe. Even after generations of luxury, it has persisted, and for this reason princes have been taught handicrafts. But the idea itself, more or less developed, dates back beyond recorded history. A realization of the fact that skill of hand is an advantage to its possessor goes back to the time when primitive man taught his son all the crafts he knew, and when the exceptionally skilled worker was regarded as possessing super-human power.

2. **The Savage Learns Handwork by Unconscious Imitation.** The savage is driven by hunger to seek food, and by the cold or the heat to devise clothing and a shelter for himself and his family. Skill of hand in these primal activities is his great source of power over his environment. Skill of hand in the making and using of weapons becomes more valuable than mere physical force in protecting the family and in procuring food. "The savage," says Davidson, "divides his activities between work and worship. Through both he seeks the satisfaction of his desire." (1—20) "Savage education, then, consists in learning how to obtain the necessities of life for self and family, and how to propitiate the unseen powers supposed to be active in nature. In his efforts after the former the savage learns the use of tools and means and is thus clearly distinguished from the lower

animals. He also learns to manufacture tools and means from wood, stone, clay, bone, wool, fibre and hides." (1—21)

But this education of the savage is not of the school; it is at first merely unconscious imitation through the social life of the family or tribe or group. (2—6) As the father is the head of the family he becomes the leader in work as well as worship. "The father, then, becomes the one who trains the younger generation in the formal conduct of life,—in the proper way of doing things." (2—8)

3. **Barbaric Peoples Learn Manual Arts Through Conscious Imitation.** When man gained the power to control fire he passed into another stage of civilization—from savagery to barbarism. (1—26) Then he was able to cook his food, to smelt metals and shape them into tools, and with these tools to engage in crafts unknown and impossible before, and to further develop many others. With this new development came also a more definite division of labor; some men became miners, others smiths, still others carpenters, masons, weavers, and so on. With this division of labor came also new social groups; common experiences in work drew men together; groups and gilds were formed of those pursuing the same craft; and sometimes a whole community became famous for skill in a single craft.

But even under these circumstances one must not think of education in the crafts in terms of present methods of learning. The process of imitation became conscious; but never as a common practice did primitive life reveal a rationalized process of instruction. (2—11) Even in the higher civilization of ancient Egypt where the closely co-operating arts of sculpture and painting were highly developed, there seems to have been no theory or system in the teaching of these arts.

Theirs was a teaching of routine, and not of theory. Models executed by the master were copied over and over again by his pupils, till they could reproduce them with absolute exactness. . . . They made their first attempts upon slabs of limestone, on drawing boards covered with a coat of red or white stucco, or on the backs of old manuscripts of no value. New papyrus was too dear to be spoiled by the scrawls of tyros. Having neither pencil or stylus, they made use of the reed, the end of which, when steeped in water, opened out into small fibres, and made a more or less fine brush according to the size of the stem. The palette was of thin wood, in shape a rectangular oblong, with a groove in which to lay the brush at the lower end.

At the upper end were two or more cup-like hollows, each fitted with a cake of ink; black and red being the colours most in use. A tiny pestle and mortar for colour-grinding, and a cup of water in which to dip and wash the brush, completed the apparatus of the student. Palette in hand, he squatted cross-legged before his copy, and, without any kind of support for his wrist, endeavoured to reproduce the outline in black. The master looked over his work when done, and corrected the errors in red ink. (3—165)

4. Social Value of Handwork Emphasized by the Ancient Jews. The fundamental motive in ancient Jewish education was religious; it was to make every child a firm believer in Jehovah. Next to instruction in the Law, however, was instruction in some trade or other vocation. The custom was for the boy to go to the school in the morning where he was taught by the Rabbis, and to remain at home in the afternoon learning the trade of his father. Thus is presented the prototype of the modern half-time school.

The special significance of this custom is not in the fact that each boy was required to learn a trade in order to earn his daily bread according to the Law, but the motive behind this custom. This motive is made clear in the Talmud, the book of traditionary law of the Jews. Here are found such statements as these: "As it is your duty to teach your son the law, teach him a trade." "Disobedience to this ordinance exposes one to just contempt, for thereby the social conditions of all are endangered." "He who does not have his son taught a trade prepares him to be a robber." "He who applies himself to study alone is like him who has no God." (4—212)

These statements make it clear that the ancient Jews recognized that to fail to give a boy an honest means of livelihood, which usually meant giving him instruction in some manual trade, was to prepare him to be a social parasite, dangerous to the community. On the other hand, to make him skilful in a manual trade was to insure his becoming a useful member of society.

The Jewish law placed the duty of teaching the trade upon the parent, and it is significant that the earliest records of apprenticeship show this same relationship between master and apprentice. In the Babylonian Code of Hammurabi (about 2250 B.C.) is the following:

If an artisan take a son for adoption and teach him his handicraft, one may not bring claim against him.

If he do not teach him his handicraft, that adopted son may return to his father's house. (5—71)

The fact that down to the beginning of the factory system in the nineteenth century the apprentice left his father's home and went to live with his master, or his maintenance was paid for by the master, is proof of the persistence of this idea of paternal relationship between master and apprentice.

5. **Labor a Religious Duty Among the Jews.** Other quotations from the Talmud would seem to go even further, and indicate that the ancient Jews regarded labor as having some religious significance. It was certainly regarded as man's duty. "Nearly all the great teachers of Talmudic times were workmen. Hillel earned money enough to attend the academy by wood-cutting. Rabbi Joshua was a blacksmith, others were tanners, carpenters, millers." (4—220) "Rabbis who gave a third of the day to study, a third to prayer, and a third to labor are mentioned with special honor. Stories were fondly told of famous teachers carrying their work-stools to their schools, and how Rabbi Phinehas was working as a mason when chosen as high priest. Of the rabbis in honor in Christ's day or later, some were millers, others carpenters, cobblers, tailors, bakers, surgeons, builders, surveyors, money-changers, scribes, carriers, smiths, and even sextons. In a nation where no teacher could receive payment for his instruction, the honest industry which gained self-support brought no false shame." (6—168) The people were encouraged in their labor by such words as these in the Talmud: "Great is the dignity of labor; it honors man." "The laborer is allowed to shorten his prayers." "It is well to add a trade to your studies; you will then be free from sin." "Beautiful is the intellectual occupation if combined with some practical work." "He who derives his livelihood from the labor of his hands is as great as he who fears God." "He who lives on the toil of his hands is greater than he who indulges in idle piety." (7—86)

Evidence seems to be lacking that the Jews appreciated as do modern educators the intimate relationship between training in

manual skill and intellectual development, but they did in a more or less general way recognize that a boy who worked with his hands was better than a boy who did not, and that study in school and labor at a manual occupation go well together, and are effective in producing useful members of society. (Source Material I, A)

6. **Attitude of the Greeks Toward Mechanical Arts.** During the Homeric age in Greece handicraftsmen occupied a place of respect, but in later times, while agriculture and cattle raising might be regarded as an occupation fit for a free citizen, since the more menial part of the work was performed by slaves or by hired labor, the work of handicraftsmen was designated as "banausic" (merely mechanical), "a word indicating a contempt that cannot be expressed in the translation. This word expressed the full scorn felt by the free citizen living on his own fortune, and devoting all his intellectual and physical powers to the State—of a gentleman, in fact,—for the man with the horny hand, who toiled in his workshop to earn his daily bread." This reproach of "banausic" was "never aimed at the rich owner of a number of slaves, who worked for his benefit; a factory owner need not take part in the work himself, but had his overseers to attend to that; it was the little man who had no other hands to work for him, and who wielded the hammer himself, or who worked the cloth in the fuller's shop, whom they looked down on." (8—498) Even artists who worked for pay and whose work depended on handicraft "were put in the same class with shoemakers, bakers and smiths."

Socrates (470–399 B.C.) is credited with giving the following reason for this attitude of contempt toward the mechanical arts:—

> The so-called banausic arts have a bad name, and quite reasonably they are in ill repute in the city-states. For they ruin the bodies of those who work at them and those who oversee them. They compel these men to remain seated and to work in gloomy places, and even to spend entire days before a fire. While their bodies are being enervated, their souls, too, are becoming much enfeebled. More especially, also, the banausic arts offer men no leisure to devote to their friends or to the state, so that such men become base in relation to their friends and poor defenders of their fatherland. And so in some of the cities, especially in those which are considered to be strong in war, no citizen is permitted to work at any banausic craft. (9—XXII, 601)

With this attitude toward handwork on the part of the citizens, the manual arts found almost no place in the training of the Greek youth of the upper classes. However, about 300 B.C., when some new subjects of instruction were being added to the schools, boys were taught drawing. They learned "to draw with a style, or brush, on boxwood tablets specially prepared for the purpose." It is supposed that this instruction was chiefly confined to drawing in outline. (8—114) (cf. 3)

However, the attitude of the upper classes did not prevent the continuance among the lower classes of the apprenticeship method of instruction which had come down from much earlier times. These same banausic arts, looked down upon by the rich and favored, were fundamental to the material development that characterized the civilization of Greece and later of Rome. There had to be some means of handing down and perfecting these arts; and the method employed, of apprenticeship, was essentially the same as was used at that time in training orators, lawyers, physicians, and cooks. (10—XX, 196, 198) The importance of apprenticeship training was at times recognized by statesmen and rulers. "Plutarch tells us that Solon, (638–559 B.C.) observing that the city was filled with persons who flocked from all parts into Attica for security of living, and that most of the country was barren and unfruitful, and that traders at sea imported nothing in exchange, turned his citizens to trade, and made a law that no son should be obliged to relieve a father who had not bred him up to any calling." (10—XX, 193)

A little later labor became more highly specialized and a prototype of the modern factory system was developed. Xenophon (430–357 B.C.) in referring to the manufacture of shoes says:

"In great cities, because there are numbers that want each particular thing, one art alone suffices for the maintenance of each individual; and frequently, indeed, not an entire art, but one man makes shoes for men, and another for women; sometimes it happens that one gets a maintenance merely by stitching shoes, another by cutting them out, another by cutting out upper leathers only, and another . . . by simply putting together the pieces." This system of production is said to have resulted in a large increase in the number of slaves. (10—XX, 193)

7. Labor a Fetish Among Early Christian Monks. With the teachings of the rabbis in the background and the example of Jesus, the carpenter of Nazareth, and his disciples in the foreground, it is not strange that the early Christian monks, in their great enthusiasm, made a fetish of manual labor. In Egypt, where the number of these hermits was very great—where there was "a kind of emigration of towns to the desert, of civilization to simplicity, of noise to silence, of corruption to innocence"—labor was required of everyone. (11—I, 182)

The days were divided between prayer and work. The work was divided between field labor and the exercise of various trades, especially the manufacture of those mats which are still so universally used in southern countries. There were among the monks entire families of weavers, of carpenters, of curriers, of tailors, and of fullers; among all, the labor was doubled by the rigor of an almost continual fast. All the rules of the patriarchs of the desert made labor obligatory, and the example of these holy lives gave authority to the rule. No exception to the contrary can be quoted, or has been discovered. The superiors were first in hardship. When the elder Macarius (before A.D. 335) came to visit the great Anthony (251–356), they immediately set to work at their mats together, conferring thus upon things important to souls; and Anthony was so edified by the zeal of his guest that he kissed his hands, saying, "What virtues proceed from these hands!"

Each monastery was then a great school of labor and at the same time a great school of charity. (11—I, 184)

The Rule of St. Basil (329–379), one of the fathers of the Greek church, insisted above all "upon the perpetual duty of labor. He would not allow even fasting to be an obstacle to work: 'If fasting hinders you from labor,' says he, 'it is better to eat like the workmen of Christ that you are.' This was the pivot of monastic life according to this patriarch." (11—I, 204)

8. Manual Labor Required by the Benedictines. Following the example of the monks of the East, St. Benedict (480–543), who founded the order of the Benedictines at Monte Cassino in Italy about 529, made manual labor one of the cardinal principles of his Rule. (Source Material I, B) "In order to banish indolence, which he called the enemy of the soul, he regulated minutely the employment of every hour of the day according to the seasons, and ordained that, after having celebrated the praises of God seven times a day, seven hours a day should be given to manual labor and two hours to reading." (11—I, 331)

This program varied slightly according to the seasons and to meet the needs of individuals and the necessities of the community life of the monastery. In following such a program they were encouraged by the thought that if they lived by the labor of their hands they were following the example of Christ and the apostles.

Quite apart from any religious or educational motive there was of course the economic motive. There was the necessity of providing food and clothing and shelter at low cost, and the desirability of being as independent as possible of the cities and towns for supplies. A monastery, "like a citadel always besieged," had within its enclosure "gardens, a mill, a bakery and various workshops in order that no necessity of material life should occasion the monks to leave its walls." (11—I, 336) Through intelligently directed industry the Benedictines not only in principle maintained "the nobility and sanctity of work, but they put their principle into practice, and set the example of enterprise and thrift in their agricultural labors. They drained the marshes, rendered fertile the sterile plains, built roads and bridges, introduced new methods of farming and exerted in the social economic order an influence as great as that which they exerted in the spiritual order." (12—I, 360)

9. **The Useful Arts Developed by the Benedictines.** While the Rule of Benedict insisted upon manual labor, it also required reading as a daily occupation of the monks. As the printing of books from type was not invented until about 1450, and block books first appeared during the same century, all the reading up to that time had to be done from manuscripts. The increase in the number of monks, therefore, called for a multiplication of manuscripts. This demand was met by the monasteries, and the copying of manuscripts became a favored occupation with the monks. To produce a fine manuscript book was looked upon as a special service to Christianity, and so into that work went religious devotion which found expression in making the books more and more beautiful. Thus grew up the art of book-making, and thus were produced those examples of the penman's art which are so much prized today. Scribe work has "accepted in place of an equal number of hours given to manual labor out-

of-doors, while skilled scribes, whose work was of special importance as instructors in the *scriptorium*, were to be freed from a certain portion of their devotional exercises and observances." (13—I, 12)

Much of the credit for developing the art of book-making is due to Cassiodorus (468–560), an Italian statesman and historian, who became a monk in 538. He was an expert penman and he was inspired with the thought of using his ability for the glory of Christ and his church. He saw the great opportunity of spreading the Gospel by multiplying books. He was also a firm believer in the Benedictine theory of labor, but he added the ideal of beauty to that of utility. So he set himself the task of teaching the monks to write freely and accurately and, also, beautifully. He taught them to write, illuminate, and bind books for the use of the monasteries which were increasing in number. He is said to have originated the *scriptorium*, a room or workshop devoted entirely to the production of books.

The religious zeal and missionary enthusiasm of the Benedictines carried them north of the Alps. "Germany was filled with monasteries which became each a center of civilization, teacher first of husbandry and then of art and literature, providing perforce in its early isolation all the means and occupations of life as well as the services of religion for the community which gathered about it, and increased with every year." (14—162) The first need of these missionary monks was for buildings; a place for worship was provided almost before shelter. While the early churches of Italy had been constructed quite largely by secular labor under the control of the bishops, the building of the churches of the North came more and more into the hands of the monks so that from the ninth to the twelfth centuries the greater part of the church building was done by the Benedictines. In the year 920 the famous monastery of Cluny was established which was "the founder of a great school of building from which grew in the next century thousands of churches." (14—163) The historian of Cluny wrote: "Towards the third year after the year 1000 the sacred basilicas were rebuilt from foundation to roof throughout almost the whole universe, especially in Italy and Gaul. Christian people seemed to vie with

each other in building the fairest and richest churches; one would have said the whole world with one accord had put off its old worn garment to clothe itself anew with churches, as with a white robe. It was not enough for the faithful to rebuild the churches of the bishops; they restored and adorned the monasteries that were dedicated to the saints, and even the village chapels." (14—164)

Not only did the monks work at building but the people were banded into trades for special service. "Prelates and monks familiar with building work made plans[1] for churches and convents, and directed the workmen." (14—165)

As a necessary part of this religious movement in book-making and building, the minor arts and crafts were developed, and scientific study and invention were stimulated. Through the promotion of agriculture, the handicrafts, and art, along with religious instruction for all, and book learning for a selected few, the Benedictines became the civilizers of barbarians and examples of enterprise, thrift, and Christian culture.

10. **Curriculum of the Monastic Schools.** Monasticism in itself was in fact a system of education in which work with the hands played an important part, though its primary purpose was not education. With its prescribed hours for labor, for reading, for worship, for rest; with its discipline and complete subjection to the will of the abbot, a monastery was a school as well as a retreat and a shrine. It attracted men, both young and old, who sought an opportunity for a life of reflection and study. Thus the monasteries came to be the schools for teaching, the place of professional training, the only universities of research, the only publishers of books, and "the only libraries for the preservation of learning; they produced the only scholars; they

[1] "The famous monastic plan preserved in the Benedictine abbey of St. Gall is not only the oldest architectural working drawing left to us, but a precise and authentic record of the manner of building in the ninth century, and in some ways more valuable than if it depicted a particular set of existing buildings, for it shows the ideal at which the enlightened builders of that day were aiming. It is a drawing on parchment, two and half feet by three and a half, dated 820, and sent to Gozpert, abbot of St. Gall at that time, by some friend who is not identified, for guidance or suggestion in the rebuilding of his monastery which was then to be undertaken." (14—169)

were the sole educational institutions of this period." (12—I, 255) On the other hand, only a very few of the monasteries offered opportunity for study outside of what were considered religious writings. These few included the study of The Seven Liberal Arts which were supposed to include all learning. They were grammar, rhetoric, dialectic (*Trivium*); arithmetic, geometry, music, and astronomy (*Quadrivium*).

As the monasteries became centers of intellectual life they gradually became centers of instruction for boys; first, for those who were offered by their parents for monastic life, and second, for those who were sent to the monasteries merely to be educated and protected.

11. **Apprenticeship in the Crafts.** Outside of the monasteries, also, participation in skilled labor was the principal means of education, though not of the kind of education which was recognized as such by the schools. As the crafts developed, becoming more differentiated and specialized, apprenticeship in these crafts included a larger body of "mysteries" to be learned and more manual skill to be gained. Up to the nineteenth century the great majority of the people, even in the progressive nations, received no schooling, and whatever of education they acquired came through their trade or occupation, and their social contacts.

Apprenticeship, then, became the chief educational institution for the middle-class youth, and his best means of rising to a position of respectability and influence in the community. As has been previously stated, apprenticeship began in the home, the father teaching his own son, and when he added another man's son he was to treat him as his own. (cf. 5) The apprenticeship period usually covered seven years. During that time the master was supposed to give to his apprentice the same moral, religious, and civic instruction that he gave his own son. He was to teach him all the mysteries of his craft, which included such recipes, rules, and applications of science, mathematics, and art as might be involved in the craft, but it would be a mistake to think of these as comparable to modern courses in the technology of a trade. The method of instruction varied with trades and masters, but there is reason to believe that

apprentice instruction in tool processes and the use of materials was almost wholly imitative. In some trades the master was required by his gild to teach reading and writing to his apprentices, and a master was not to take any more apprentices than he could "keep, inform, and teach." (Source Material I, c and I, d)

SOURCE MATERIAL I, A

All These Trust in Their Hands

From the Apocryphal Book of Ecclesiasticus.[1]

The wisdom of a scribe cometh by opportunity of leisure:
And he that hath little business shall become wise.

How can he get wisdom that holdeth the plough,
That glorieth in the goad
That driveth oxen, and is occupied in their labors,
And whose talk is of bullocks?
He giveth his mind to make furrows,
And his sleepless care is to give the kine fodder.

So every mason and master builder
That laboreth night and day
And they that cut and grave seals
And he who is persevering in making manifold figures,
Who give themselves to make a lifelike picture,
And whose sleepless care is to finish a work.

So the smith, sitting by the anvil
And tiring himself with the rough iron:
The smoke of the fire wasteth his flesh.
And he fighteth with the heat of the furnace:
The noise of the hammer deafens his ear,
And his eyes are upon the pattern of the utensil:
He giveth his mind to finish his work,
And his sleepless care is to polish it on completion.

So the potter sitting at his work,
And turning the wheel about with his feet,
Who is always anxious about his work,
And maketh all his work by number.
He fashioneth the clay with his arm,
And maketh it pliable with his feet;
He applieth himself to glaze it over;
And his sleepless care is to make clean the furnace.

[1] (Written by Jesus, son of Sirach of Jerusalem, in 280 B.C. By some he is thought to have been a priest, by others a physician.)

All these trust to their hands,
And every one is wise in his work.
Without these shall not a city be inhabited;
And men shall not dwell abroad, nor go up and down:
They shall not be sought for in public counsel,
Nor sit high in the congregation;
They shall not sit on the judge's seat,
Nor understand the statutes of the covenant:
They shall not bring to light instruction and judgment:
And they shall not be found where parables are spoken.
But they will maintain the world,
And their prayer be for the work of their craft.

(15—chap. xxxviii)

SOURCE MATERIAL I, B

Extracts from the Rule of St. Benedict

From *Select Historical Documents of the Middle Ages* by Ernest F. Henderson

48. *Concerning the daily manual labour.* Idleness is the enemy of the soul. And therefore, at fixed times, the brothers ought to be occupied in manual labour; and again, at fixed times, in sacred reading. Therefore we believe that, according to this disposition, both seasons ought to be arranged; so that, from Easter until the Calends of October, going out early, from the first until the fourth hour, they shall do what labour may be necessary. Moreover, from the fourth hour until about the sixth, they shall be free for reading. After the meal of the sixth hour, moreover, rising from table, they shall rest in their beds with all silence; or perchance, he that wishes to read may so read to himself that he do not disturb another. And the nona (the second meal) shall be gone through with more moderately about the middle of the eighth hour; and again they shall work at what is to be done until Vespers. But, if the exigency or poverty of the place demands that they be occupied by themselves in picking fruits, they shall not be dismayed: for then they are truly monks if they live by the labours of their hands; as did also our fathers and the apostles. Let all things be done with moderation, however, on account of the faint-hearted. From the Calends of October, moreover, until the beginning of Lent they shall be free for reading until the second full hour. At the second hour the tertia (morning service) shall be held, and all shall labour at the task which is enjoined upon them until the ninth. The first signal, moreover, of the ninth hour having been given they shall each one leave off his work; and be ready when the second signal strikes. Moreover, after the refection they shall be free for their readings or for psalms. But in the days of Lent, from dawn until the third full hour, they shall be free for their readings; and, until the tenth full hour, they shall do the labour that is enjoined on them. In which days of Lent thy shall read entirely through in order. These books are to be given out on the first day of Lent. Above all there shall certainly be appointed one or two elders, who shall go round the monastery at the hours in which the brothers are engaged in reading, and see to it that no

troublesome brother chance to be found who is open to idleness and trifling, and is not intent on his reading: being not only of no use to himself but also stirring up others. If such a one—may it not happen—be found, he shall be admonished once and a second time. If he do not amend, he shall be subject under the Rule to such punishment, that the others may have fear. Nor shall brother join brother at unsuitable hours. Moreover on Sunday all shall engage in reading: excepting those who are deputed to various duties. But if anyone be so negligent and lazy that he will not or can not read, some task shall be imposed upon him which he can do; so that he be not idle. On feeble or delicate brothers such a labour or art is to be imposed, that they shall neither be idle, nor shall be so oppressed by the violence of labour as to be driven to take flight. Their weakness is to be taken into consideration by the abbot.

57. *Concerning the artificers of the monastery.* Artificers, if there are any in the monastery, shall practice with all humility their special arts, if the abbot permit it. But if any one of them becomes inflated with pride on account of knowledge of his art, to the extent that he seems to be conferring something on the monastery: such a one shall be plucked away from that art; and he shall not again return to it unless the abbot perchance again orders him to, he being humiliated. But, if anything from the works of the artificers is to be sold, they themselves shall take care through whose hands they (the works) are to pass, lest they (the intermediaries) presume to commit some fraud upon the monastery. They shall always remember Ananias and Sapphira; lest, perchance, the death that they suffered with regard to the body, these, or all those who have committed any fraud as to the property of the monastery, may suffer with regard to the soul. In the prices themselves, moreover, let not the evil of avarice crop out: but let the object always be given a little cheaper than it is given by other and secular persons; so that, in all things, God shall be glorified. (16—297, 302)

SOURCE MATERIAL I, c

Apprenticeship in the Middle Ages
By L. F. Salzman

From *English Industries in the Middle Ages*

"Apprenticeship was from quite early times the chief, and eventually became practically the only, path to mastership. The ordinances of the London leather-dressers, made in 1347, and those of the pewterers, made the next year, give as alternative qualifications for reception into the craft the completion of a period of apprenticeship, or the production of good testimony that the applicant is a competent workman. A similar certificate of ability was required of the dyers at Bristol, in 1407, even if they were apprentices, but as a rule the completion of a term of apprenticeship was a sufficient qualification. That term might vary considerably, but the custom of London, which held good in most English boroughs, eventually fixed it at a minimum of seven years. This would often be exceeded, and we find, for instance, a boy of fourteen apprenticed to a haberdasher in 1462 for the rather exceptional term of twelve years; but in this case the master had undertaken to provide him with two years' schooling, the first year and a half to learn

'grammer,' and the next half year to learn to write. In the same way a goldsmith's apprentice in 1494 agreed to serve ten years instead of nine provided his master would keep him one year at a writing school. A certain amount of teaching, apart from technical training, was usually stipulated for in indentures of apprenticeship. A weaver at Taunton agreed to give his apprentice 'instruction in the language of Britanny,' while conversely a London carpenter was allowed 'to have home hys prentys tyll he can speke better engleys.' Amongst the goldsmiths fines were inflicted for failing to have apprentices taught to read and write, and by the will of Maud, widow of John de Mymmes, image-maker, who died, with her husband, at the time of the Black Death, an apprentice, to whom she makes various bequests, was to be handed over to the care and teaching of Brother Thomas de Alsham of Bermondsey Priory for three years. In a list of apprentices who took the oath of fealty to the king and the city at Coventry in 1494, the terms range from five to nine years, though the majority were for seven years; during the first years of their terms, they were to receive nominal wages, usually 12*d.* a year, and for their last year more substantial rewards, varying from 6*s.* 8*d.* to 25*s.* The oath to obey the city laws serves as a reminder that the apprentice, not being a full member of the gild, was under the charge of the city authorities to some extent. Indentures of apprenticeship had as a rule to be enrolled by the town clerk, and in London the transfer of an apprentice from one employer to another was not legal unless confirmed by the city chamberlain. Besides having his indentures enrolled, and paying a fee to the craft gild, the apprentice, or rather his friends, had to give a bond for his good behaviour. Masters had the right of correcting their apprentices with the rod, within reason, and the city authorities would have little mercy on such young men as John Richard, who, when his employer wished to chastise him 'as reson and comon usage is' for divers offences, 'of very malice and cursednesse as an obstinat apprentis to his master' picked up an iron bar and threatened to kill him. The rights of the apprentice, on the other hand, were probably always guarded by a right of appeal to the wardens of his craft; this was certainly the case at Coventry in 1520, the masters of the cappers being obliged to go once a year to all the shops of their craft and call the apprentices before them, and if any apprentice complained three times against his master for 'insufficient finding,' they had power to take him away and put him with another master. As a master's interest in his apprentice was transferable to another master, so it was possible for an apprentice to buy up the remainder of his term after he had served a portion. He could not, however, be received into his gild as a master until the whole of his term had expired, and although it would seem that he could set up in business by himself, probably he might not employ workmen, and as a rule he no doubt spent the unexpired portion of his term as a journeyman." (17—340–343)

SOURCE MATERIAL I, D

Apprenticeship as Education
by Jonathan French Scott

From *Historical Essays on Apprenticeship and Vocational Education*

The success of the apprenticeship system during the Middle Ages and the period of the Renaissance was largely due to two factors: First, the close

personal relationship and identity of interest existing between master and apprentice; and second, the supervision of master and apprentice by the craft gilds. These factors were fostered by the social and economic conditions of the Middle Ages, but passed away under the changed economy of modern times. To the loss of the proper personal relationship and identity of interest existing between master and apprentice, and to the lack of adequate supervision over this relationship is partially due the decay of the apprenticeship system. . .

The reciprocal duties of master and apprentice are set forth in a general way in the indentures—articles of agreement at the time of binding—many of which are preserved in ancient records. These indentures show that the chief duty of the apprentice was to serve his master faithfully, not only in business, but in the performance of household tasks or other services; the master was obliged to teach the lad his trade, to house, feed and clothe him. More than this, he was supposed to give the youth such moral and religious training as a boy of immature years would naturally require. In a word, it was his duty to prepare the boy to be not merely a good craftsman but a good citizen as well. The closeness of the personal relationship between the two is clearly brought out by the fact that not rarely the apprentice led his master's daughter a bride to the altar.

The apprenticeship system, as it existed in medieval times, offered opportunity to the youth of learning all branches of his trade. The shop was small; master and apprentice often worked side by side at the same bench. The master himself worked at all processes of his handicraft, and therefore it was comparatively easy for him to teach all processes to the lad at his side. It was comparatively easy, too, for the lad to follow all the workings of his master and to imitate them. The number of apprentices being small the master could give each one a large part of his attention. Furthermore, as there were but few apprentices and journeymen, there was but little division of labor, and therefore but little of the modern tendency to keep a boy employed on one or two processes to the exclusion of all others. It was to the interest of the master that the apprentice be able to assist him at every process of the craft. To the master, too, accrued the profits of the apprentice's toil during the latter's term of service, and the more skilful the boy, the greater the gains of his employer.

In the same way the apprenticeship system favored the development of artistic ability. The long term of service, usually seven years in England, somewhat less on the Continent, gave opportunity for the acquirement of that refinement of skill so necessary to the true artist. The careful individual attention given by the right sort of master to the apprentice enabled the latter to avoid superficiality, while his own work furnished a worthy example for the lad's imitative powers. Then, too, since whatever the apprentice earned went to his master, the young man was forced to find his rewards, not in immediate pecuniary gain, which might tempt him to quick, superficial work, but in his employer's praise and in the joy of artistic creation. Finally the fact that he was one day to be a master himself would naturally lead the apprentice to a desire to acquire a knowledge of all processes of his craft, and to a dexterity of hand and artistic skill in construction. In general, then, the interests of master and apprentice in the days of handicraft were largely identical.

Whatever may have been its weak points the medieval apprenticeship system is by no means to be despised: it was well adapted to the social and economic conditions of the time. The household, the small shop, and the gild were the great factors in industrial life. There was little capital, little machinery, no factory system, no great gulf between employer and employee. The apprentice became a part of his master's household and was given a home and instruction in a trade at but little expense save that of time. If the master did his duty, skill and artistic ability were developed in the lad. At the end of his term of service he passed into the ranks of the master craftsmen and looked forward to a life of comparative economic security and perhaps of some honor as a skilled artisan or merchant, and as a citizen. If there was little opportunity for him to rise out of his class there was great opportunity for him to rise in it.

On the other hand, the apprentice was an important asset to the master, giving him increasingly valuable aid in his craft work, attending to his customers, and performing irksome menial duties for his employer, his employer's wife, and other members of the household. Broadly speaking, the interests of master and man did not conflict, but were in large measure identical. Such a relationship grew from the fact that the household and the small shop were the foundations of industry.

By means of craft supervision, and especially by means of the examination system, the gild was able to see that a certain standard of workmanship was maintained. Towns were small, gild members few, concealment of bad conduct difficult, so that gild supervision could be made very effective.

We need not hesitate to affirm that the result of this system of apprenticeship was the development of well-wrought and artistic productions. It can scarcely be denied that the superiority of the later Middle Ages and of the Renaissance over the early Middle Ages, in the field of industrial arts, was due in some degree to the institution of apprenticeship. The system offered opportunity for the development of skill and artistic ability, and while it is true that not every apprentice took advantage of this opportunity, some did, and produced good work. On the whole, the institution met the needs of medieval and early modern times as a system of industrial education. (18—50–58)

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CHAPTER II

The Relationship Between Things and Thoughts

12. **A New Conception of the Process of Education.** The invention and early development of the art of printing (1423–1480), the revival of classical learning, especially in Italy, during the fifteenth century, and the Protestant Reformation with its center in Germany, beginning early in the sixteenth century, unfolded new educational possibilities and put new life into teaching methods. The same spirit that sailed out into the unknown and discovered a new continent also sought out new philosophies and new methods for the schools which bore fruit in the sixteenth and seventeenth centuries. During this period there appeared two of the fundamental ideas upon which modern instruction in the manual arts has been built. The first of these is that sense impressions are the basis of thought and, consequently, of knowledge. The second is the related idea of "learning by doing." Out of the first idea grew the object method of teaching and, later, the laboratory method; out of the second came the recognition of the value of working through a process, of making something with the hands or with tools, of doing something skilfully, as a basis for rational thinking. This idea led to placing handicrafts in the school and the children in the workshop and in the field to receive instruction.

13. **Luther Advocated a State-Supported, Comprehensive Education for All Children.** Quite in harmony with the protests of Martin Luther (1483–1546) against the authority of the papacy were his protests against the education given in monastic and ecclesiastical schools. He looked upon a boy in a monastic school as being in a prison; the boy was like a bird in a dark cage or like a young tree required to grow in a flowerpot. "This monkish tyranny," he said, "is an absolute injury

to the young; for they stand in quite as much need of pleasure and recreation as of eating and drinking."(1—413) He proposed to have the reform come through the power of the State. The right kind of schooling should be given to "all the people, noble and common, rich and poor; it was to include both boys and girls—a remarkable advance; finally, the State was to use compulsion if necessary." "Luther advocated a school day of two hours, so arranged that it would allow the older children and youth to carry on the ordinary economic duties of life uninterruptedly." "My opinion," said Luther, "is that we must send the boys to school one or two hours a day, and have them learn a trade at home for the rest of the time. It is desirable that these two occupations march side by side." (1—413)

This recommendation may seem to be essentially the same as that of the Jewish teachers in Talmudic times (cf. 4) but it should be noticed that social conditions have changed and that the motive and spirit and scope of education have become different. The school has become more comprehensive. The curriculum advocated by Luther included Latin and Greek and Hebrew, logic, mathematics, and music, and also history and science, as then understood. (1—412)

14. **Rabelais Would Approach Knowledge Through the Use of Objects and the Observation of Processes.** While Luther in Germany was still protesting against indulgences in the Church and "monkish tyranny" in the schools, Rabelais (1483–1553) in France began to hurl his shafts of satire against the formalism, insincerity, and shallowness of the Church, the school, and the State. Rabelais, however, remained in the Roman Catholic church though he was in constant disagreement with some of its high officials. His education in church schools, his life as a monk, and his training and practice in medicine gave him a fact basis for his two novels *Gargantua* and *Pantagruel* into which he wove his ideas of reform. In describing the birth and early education of Gargantua the author brings together the most depraved practices of the child life and education of the times. Then he turns Gargantua over to his ideal teacher, Ponocrates, who

first gives him some magic medicine by which he "cleansed all the ateration and perverse habitude of his brain." By this means Ponocrates causes him to forget all he had learned, and so has a fair chance in beginning his education over again. (2—I, 175) This new education of Ponocrates, true to the spirit of the Renaissance, places the study of the Greek and Latin classics alongside of the religious education of the church, but it approaches these studies from a new angle which foreshadows the methods formulated and applied by Pestalozzi nearly three hundred years later. "The educational importance of Rabelais," however, "comes, not from any immediate and concrete influence on schools, but from the influence of his ideas exerted upon Montaigne, Locke, and Rousseau." (1—446)

Rabelais saw the advantage of approaching the abstract and remote through the concrete and near at hand. An illustration of this is found in his reference to the fact that Gargantua and his companions while at dinner "began to discourse merrily together; speaking first of the virtue, propriety, efficacy and nature of all that was served at that table; of bread, of wine, of water, of salt, of fleshes, fishes, fruits, herbs, roots, and their dressing. By means whereof, he learned in a little time all the passages competent for this, that were to be found in Pliny, Athenaeus, Dioscorides, Julius Pollux, Galen, Porphyrius, Oppian, Polybius, Heliodorus, Aristotle, Œlian, and others. Whilst they talked of these things, many times, to be the more certain, they caused the very books to be brought to the table, and so well and perfectly did he in his memory retain the things above said, that in that time there was not a physician that knew half so much as he did." (2—I, 177)

Again he tells how Gargantua came to like arithmetic: "They brought in cards, not to play, but to learn a thousand tricks, and new inventions, which were all grounded upon arithmetic. By this means he fell in love with that numerical science, and every day after dinner and supper he passed his time in it as pleasantly as he was wont to do at cards and dice." (2—I, 178)

Gargantua is taught to play musical instruments and he devotes much time to physical training. Esquire Gymnast teaches him the art of riding, in which he gains great skill, and to use a variety of implements of warfare. He becomes an expert swimmer and boatman. In rainy weather he and his companions "did recreate themselves in bottling up of hay, in cleaving and sawing of wood, and in threshing sheaves of corn at the barn." (2—I, 183) Rabelais seems, in general, to have accepted the attitude of the Greek citizen toward manual labor (cf. 6) but he sees some advantage in it as a means of recreation. The arts of painting and carving he places on the same plane with playing games as a rainy-weather occupation. Knowledge of handicrafts and industries was gained through observation only:

> They went likewise to see the drawing of metals, or the casting of great ordnance: how the lapidaries did work, as also the goldsmiths and cutters of precious stones. Nor did they omit to visit the alchymists, money-coiners, upholsterers, weavers, velvet-workers, watchmakers, looking-glass framers, printers, organists, and other such kind of artificers, and, everywhere giving them somewhat to drink, did learn and consider the industry and invention of the trades. (2—I, 183)

15. **Mulcaster Makes Drawing One of the Fundamental Studies.** Immediately following Rabelais, the famous English schoolmaster, Richard Mulcaster (1531–1611), head master of Merchant Taylor's School from 1561 to 1586, was laying the foundation for the modern science of education. He believed that "the hand, the ear, the eye be the greatest instruments whereby the receiving and delivery of our learning is chiefly executed." (3—95) He thought that all children should learn to read and write but he was most interested in discovering and developing the special abilities of the few. Having broken with classical tradition and living before the advent of "the unfortunate three R's," Mulcaster organized an elementary school curriculum consisting of (1) reading (English), (2) writing, (3) drawing, (4) singing, and (5) playing a musical instrument, (3—97). He has been given the credit for being the first to make drawing one of the fundamental studies of the school. (cf. 6) However, he makes no claim to origin of the

idea of the merits of drawing. On the contrary, in one of his arguments for drawing he refers to Aristotle's *Politikes* thus:

There he sayeth, that as writing and reading do minister much helpe to trafficque, to housholdrie, to learning, and all publicke dealinges: so drawing by penne or pencil is verie requisite to make a man able to iudge, what that is which he byeth of artificers and craftes men, for substannce, forme, and fashion, durable and handsome or no: and such other necessarie seruices, besides the delitefull and pleasant. (4—35)

If this were in the form of twentieth-century instead of sixteenth-century English it would easily be mistaken for our very latest argument for the introduction of drawing into public schools—to cultivate appreciation of refinement of line and tint and space division for practical use and for pleasure. But Mulcaster's point of view in reference to drawing is more completely expressed in the following:

For penne and penknife, incke and paper, compasse and ruler, a deske and a dustboxe will set them both vp, and in these young yeares, while the finger is flexible, and the hand fit frame, it will be fashioned easely. And commonly they that have any naturall towardnesse to write well, have a knacke of drawing to, and declare some euident conceit in nature bending that waye. And as iugement by vnderstanding is a rule to the minde to discern what is honest, seemly, and sutable in matters of the minde, and such argumentes as fall within compasse of generall reason exempt from sense: so this qualitie by drawing with penne or pencil, is an assured rule for the sense to iudge by, of the proportion and seemelines of all aspectable thinges. As he that knoweth best, how to kepe that himselfe, which is comely in fashion, can also best iudge when comlinesse of fashion is kept by any other. And why is it not good to have euery parte of the body: and euery power of the soule to be fined to his best? (4—34)

His attitude toward the use of pigments in connection with drawing is revealed in this brief paragraph:

For the setting of colours I do not much stand in, howbeit if any dexterity that waye do draw the child on, it is an honest mans liuing and I dare not condemne that famous fellowship: which is so renowned for handling the pencill.

16. **Bacon's Philosophy of Realism.** At the opening of the seventeenth century educational thought was profoundly affected by the philosophical writings of Francis Bacon (1561–1626). His thinking took him out of the beaten track of those who found all learning in the writings of antiquity, and revealed to him in nature and the arts of daily life the

basis for a new learning. He did not believe that all wisdom had been revealed to man, and so he sought to indicate a method of new discovery. He said to the scholars: "Be not wrapped up in the past, there is an actual present lying all about you; look up and behold it in its grandeur. Turn away from the broken cisterns of traditional science, and quaff the pure waters that flow sparkling and fresh forever from the unfathomable fountain of creation. Go to nature and listen to her many voices, consider her ways and learn her doings; so shall you bend her to your will. For knowledge is power." (5—V, 680) Again he said that "men have withdrawn themselves too much from the contemplation of nature and the observations of experience, and have tumbled up and down in their own reason and conceits." (6—I, 37)

Bacon pointed out that the way to study nature was not merely to learn what others had written but to go straight to nature and learn through the senses. "He held that all knowledge must be obtained by a careful and unprejudiced induction from facts. Hence the importance of experiment." (7—68) Thus he gave to intellectual life a new impulse and a new field for exploitation. Bacon's philosophy of realism, therefore, provided the motive force in education that later developed our modern schools of applied science.

The following quotation illustrates Bacon's point of view in reference to the handicrafts and reveals the fact that in his first book, published in 1605, he uses the term "manual arts" which is often thought of as being of very recent origin. In discussing the importance of history, "natural, civil, ecclesiastical, and literary," and the fact that too little of history is known and available, he says:

For history of nature wrought or mechanical, I find some collections made of agriculture, and likewise of manual arts; but commonly with a rejection of experiments familiar and vulgar. For it is esteemed a kind of dishonour unto learning to descend to inquiry or meditation upon matters mechanical (cf.6), except they be such as may be thought secrets, rarities and special subtilties; which humour of vain and supercilious arrogancy is justly derided in Plato; where he brings Hippias, a vaunting sophist, disputing with Socrates, a true and unfeigned inquisitor of truth; where the subject being touching beauty, Socrates, after his wandering manner of inductions, put first an example of a fair virgin, and then of a fair horse, and then of a fair

pot well glazed, whereat Hippias was offended, and said, *More than for courtesy's sake, he did think much to dispute with any that did allege such base and sordid instances.* Whereunto Socrates answereth, *You have reason, and it becomes you well, being a man so trim in your vestiments, etc.*, and so goeth on in an irony. But the truth is, they be not the highest instances that give the securest information; as may be well expressed in the tale so common of the philosopher, that while he gazed upwards to the stars, fell into the water; for if he had looked down he might have seen the stars in the water, but looking aloft he could not see the water in the stars. So it cometh often to pass, that mean and small things discover great, better than great can discover the small. (6—II, 13)

17. Comenius Advocates Teaching According to the Order of Nature and the Arts. The most famous educational writer of the seventeenth century was John Amos Comenius (or Komansky) (1592–1670). He was born in a Moravian village, educated in Germany, taught school for a while in his native country, entered the service of the Church, was persecuted along with other Protestants, and forced to flee from his own country. He lived in several European countries where he wrote books on education, among which was the *Great Didactic.* Another was a first Latin book for children in which pictures of objects were shown with their names and some informative text in Latin and the mother tongue in parallel columns below the pictures. This book was called the *Orbis Pictus.* It was first published in Nuremburg in 1657.'(17—364)

Like Rabelais he believed that instruction in words and things should go together. "The young were to learn about things, and at the same time were to acquire, both in the vernacular and also in Latin, the international tongue, the words which were connected with the things." He would have children learn, "as much as possible, not from books, but from the great book of nature, from heaven and earth, from oaks and beeches." (3—139) The subjects taught must not be too difficult for the children to comprehend and the method must be according to the order of nature. This he conceived to be: Educate (1) the senses, then (2) the memory, then (3) the intellect, and last of all, (4) the critical faculty. "The child perceives through the senses; everything in the intellect must come through the senses." (3—138) Another aim of Comenius was to make the process of learning agree-

able to the learner. He believed that this would be accomplished by following the order of nature and of art.

Comenius agreed with Luther (cf. 13) that all children of both sexes should be sent to school, but he said that nothing had been done to carry out Luther's ideas. Comenius proposed a system of education that included (1) an infant school in every home for children up to six years of age, (2) a vernacular school, or public elementary school, in every village or community for children from six to twelve years of age, (3) a *Gymnasium*, or secondary school, in every province, for selected students from twelve to eighteen years of age, and (4) a university in every kingdom or large province for young men who would continue their education beyond the age of eighteen. (8—138) (9—408) Thus he divided the first twenty-four years of a scholar's life into four periods of six years each.

The infant school, or mother school, of Comenius was a forerunner of Froebel's kindergarten. In this school play was utilized as a means of education. In the opening of the chapter on activity and expression in his *School of Infancy* he says:

> Boys ever delight in being occupied in something, for their youthful blood does not allow them to be at rest. Now as this is very useful, it ought not to be restrained, but provision made that they may always have something to do. Let them be like ants, continually occupied in doing something, carrying, drawing, construction and transporting, provided always that whatever they do be done prudently. They ought to be assisted by showing them the forms of all things, even of playthings; for they cannot yet be occupied in real work, and we should play with them. (10—44)
>
> Inasmuch as children try to imitate what they see others do, they should be permitted to have all things, excepting such as might cause injury to themselves, such as knives, hatchets and glass. When this is not convenient, in place of real instruments they should have toys procured for their use; namely, iron knives, wooden swords, plows, little carriages, sledges, buildings, etc. With these they may amuse themselves, thus exercising their bodies to health, their minds to vigor, and their bodily members to agility. They are delighted to construct little houses, and to erect walls of clay, chips, wood, or stone, thus displaying an architectural genius. In a word, whatever children delight to play with, provided it be not harmful, they ought rather to be gratified than restrained from it; for inactivity is more injurious to both mind and body than anything in which they can be occupied. (10—45)

In the fourth or fifth year Comenius would have the children "exercised in drawing and writing. according as their

inclination may be noticed or excited, supplying them with chalk, with which they may at their will make dots, lines, hooks, or round O's, of which the method may be easily shown, either as an exercise or amusement." (10—46)

The curriculum of the vernacular school was intended to include "all that is proper for a man, and is one in which all men who are born into this world should share." (9—418) The Latin school or *Gymnasium* which followed was for selected students who were to receive a liberal education. Comenius differed from many of his contemporaries in insisting that all children, girls as well as boys, were entitled to as much education as was provided in his plan for the vernacular school. He believed in educational equality to that extent. Moreover, he considered it "undesirable to create class distinctions at such an early age." (9—418) "When boys are only six years old," he says, "it is too early to determine their vocation in life, or whether they are more suited for learning or for manual labor. At this age, neither the mind nor the inclinations are sufficiently developed, while, later on, it will be easy to form a sound opinion on both." (9—419) Therefore between the ages of six and twelve he would have all children taught (1) to read in their mother-tongue, (2) to write with accuracy, speed, and confidence in accordance with the rules of the grammar of the mother-tongue, (3) to count, (4) to measure, (5) to sing, and (6) to learn by heart many psalms and hymns. They should (1) know the Catechisms and many Bible stories and verses, (2) the principles of morality, (3) something of economics and politics, (4) general history and (5) geography, and finally (6) "they should learn the most important principles of the mechanical arts, both that they may not be too ignorant of what goes on in the world around them, and that any special inclination towards things of this kind may assert itself with greater ease later on." (9—421) But there is no indication that Comenius had reached the point in his thinking where he would teach the mechanical arts through shopwork instruction in the school. Concerning the daily program he says that class lessons should not exceed four daily for the vernacular school, two of these before mid-day and two after.

"The remaining hours of the day may profitably be spent in domestic work (especially among the poor), or in some form of recreation." "The morning should be devoted to the exercise of the intellect and the memory, the afternoon to that of the hand and voice." But the handwork consisted of writing—transcribing portions of printed books. (9—424) The mechanical arts were to be learned from a book prepared for the purpose, but there seems to be no statement of just what it should contain.

Comenius has been called "the father of modern pedagogy." This is because of his early formulation of principles and methods which, two centuries later, were in harmony with the main current of pedagogical development.

One of the contributions of Comenius which is of special interest to the student of industrial education is his exposition of the "method of the arts." (Source Material II, A) This is the result of an analysis of the methods then in vogue in the teaching of a handicraft, that is, through apprenticeship. The purpose of Comenius, however, in thus writing on the "method of the arts" was not to show how handicrafts should be taught in the school, for, as has been said, he did not include in his school curriculum the handicrafts to which he refers but they were to illustrate a rational method of teaching the school subjects of his time. If shopwork and drawing had been included in his scheme of education, he would doubtless have recommended that they be taught according to his "method of the arts."

18. **Progressive Educational Thinking in England.** The man who brought the writings of Comenius to public attention in England was Samuel Hartlib (1600?–1670?). Hartlib was the son of a Polish father, of German descent, and an English mother, and was born in Elbing, Prussia, but the date of his birth is not definitely known. (11—4) He came to London in 1628 and set up as a merchant, though he devoted his best energies to various schemes for the public good. He was one of those progressive citizens who take an interest in every question or project promising social improvement, who are constantly forming committees or writing letters to persons

of influence, and who seem to live for the public rather than for themselves. By common consent of those who have explored the intellectual and social history of England in the seventeenth century, Hartlib was one of the most interesting and memorable figures of that whole period. (12—III, 194) Governor Winthrop of Connecticut once spoke of him as "the Great Intelligencer of Europe." (13——) It is easy to understand, therefore, how it came about that he was the center of a remarkable group of men who, following his lead, and inspired by the new Baconian philosophy, were transforming the educational thought of their time.

Among these men were John Dury (1596–1680), the Puritan preacher; John Milton (1608–1674), the poet; John Evelyn (1620–1706), writer on forestry and gardening and, later, secretary of the Royal Society; Hezekiah Woodworth (1590–1675), interested in the education of defectives; and Sir William Petty (1623–1687), statistician political economist, and professor of anatomy at Oxford.

John Dury developed a scheme for uniting all the Protestant churches of Europe into one powerful body. Hartlib first met Dury in his native town of Elbing, where he was then acting as chaplain to the English company of Merchants in the town. Hartlib was a convert to Dury's scheme and became the missionary for his ideas when he went to England. Later, Dury became interested in problems of education, and wrote out his ideas on the subject under the title *The Reformed Schoole.* In his plan the teachers were to do most of the work. They were to organize and methodize the subject-matter of instruction so that it would be "a delightful recreation by the variety and easiness thereof." Piety, health, manners, and learning were the aim of his plan, and as a part of the health program, pupils were to exercise their bodies "in husbandry or manufactures or military employments." (3—204)

John Milton, the poet, was a friend of Hartlib, but he could not fully agree with him concerning some of the doctrines of Comenius. Hartlib therefore urged him to write out his own ideas. This resulted in Milton's tract entitled *Of Education* addressed to Mr. Hartlib and published in the year 1644.

(12—III, 233) In this he described "a complete and generous education, that which fits a man to perform justly, skilfully, and magnanimously, all the offices both private and public, of peace and war." In the studies selected Milton was a radical but with a curious mixture of conservatism. Instead of the customary torture and toiling of the disciplinary study of Latin and Greek he would have each study stand the test of usefulness, and he would have the method of learning delightful to young minds. "Things rather than words; the facts of nature and of life; real science of every possible kind; this, together with a persistent training in virtuous and noble sentiment, and a final finish of the highest literary culture, was to compose the new education." (12—III, 240) But he says nothing about the teaching of English. As the acquisition of useful information was his purpose and as such information was in the Latin and Greek languages, these languages must be studied. He would have the children read Cato, Varro, and Columella to awaken in the minds of the children a love for rural pursuits which later might lead them to agriculture, while at the same time they would be learning the ancient language. In like manner with a two-fold purpose he would have the pupils read the works of the Latin and Greek authors on natural history, geography, natural philosophy, mathematics, architecture, engineering, navigation, and other useful subjects. (14—III, 469) To give all these subjects "a real tincture of natural knowledge," the teachers would call in the hunters, fowlers, fishermen, shepherds, gardeners, apothecaries, architects, engineers, mariners, and anatomists, who would give the pupils the benefit of their experiences. In his scheme of studies he includes also the Classic poets and great writers on ethics, economics, politics, jurisprudence, theology, and history. (14—III, 471) For exercise and amusements he recommends swordsmanship, wrestling, horsemanship, music, and excursions, the latter affording an opportunity for many profitable observations. (14—III, 475)

19. **The Earliest Plan for a College of Agriculture in England.** It was characteristic of Hartlib that he spent more effort in promoting the schemes of others than in setting forth

his own ideas. An exception to this rule was his plan for a college of agriculture. He believed that the future prosperity of the nation required that more attention be given to agriculture and that agriculture itself must be developed by bringing to the solution of its problems the thought of educated men. With such an end in view he proposed the earliest plan for an agricultural college in England, or as he termed it *Propositions for Erecting a College of Husbandry.* He advocated "the erection of a private Colledge or Society of good Husbandry; wherein some may teach, some learne, and all practice the whole and every part of this so honourable an art, so deep a mystery, and that not onely in the more customary and common way, but according to the most excellent rules, that Ingenuity and Experience gained by rational trials and real experiment have or can attain to: that so the honour, wealth, and happiness of this State may be multiplied, even before itself is aware, and the duller members thereof more by emulation or example to such practises for their own private and publique good, as no persueasion nor force could ever have effectually led them to. (15—XI, 191)

He proposed to appeal to the wealthy who had a love for their country to establish this institution.

His plan was to have the College pay 20 per cent yearly dividend on investment except in case where the money was to be used for some specified branch of the art, in which case he would have to wait "till Nature hath produced the return." Money invested could be withdrawn on six months' notice.

The following statement reveals more fully his purpose and his estimate of the general attitude toward agriculture at that time in England:

> I propound that there may be a Colledge or School of all the sorts and parts of good-Husbandry erected; that so the knowledge and practise may become more universal, and men may have more sweet invitations and stronger allurements, to seek the knowledge of this deep and excellent mystery; and practise it to the advancement of a more general and Publique good; Not as now in a sordid clownish way for meer selfe profit; Nor as now according to unsound and rather customary than rational rules and grounds; Nor as now in a dishonourable drudging way; which indeed is the grand cause that hinders or takes off the most ingenious spirits (which yet are most fit to be engaged). For it is plain, that the chief reason, why this so excellent an art,

hath hitherto arrived at no greater perfection, is; that no publique course of incouragement and high prizing the same hath been thought of; and so the best wits shut out, that should have searched it out, and discovered this art more perfectly; which once generally known, together with the vast advantages thereby arising, as to the whole Nation; so to every particular practitioner; we need not fear to want disciples. It is most evident, that those few ingenious persons, that have looked into the wayes of improvement (having some thing also to work upon) of late years have advanced their particular interests to a double or trebble proportion. I am very confident, that those very improvements may again be doubled by yet better ways. (15—XI, 191)

The college was to be organized on the apprenticeship plan. Each student or apprentice was to be indentured for seven years, during which time the college was to teach him the theory and practice of the art, trade, or mystery and at the end of the time he was to receive in "one entire payment to set up withal, 300 pounds." If he were to remain four years more "till he had taken better root," he was to receive 100 pounds a year during that time.

The conditions of admission to this apprenticeship were that he (1) must be fifteen or more years of age, (2) must have at least ingenuity, (3) must subscribe himself a seeker for advancement of the "Mystery and Society," (4) must live in commons at the Hall, (5) must be single (if married he becomes dead to the Society), (6) must pay 50 pounds on entrance, must have at least 250 pounds as a stock to set up for himself, must pay for servant, for horse, and other prescribed items.

The plan was clearly not for poor men's sons but for young men of means who were desirous of entering agriculture as a business or profession and who believed that its advancement could be made to serve their own interests and those of the nation.

Hartlib's purpose was to elevate farming or husbandry to the level of an art. "And the thing which I hold forth is nothing else, but to screw the most profound mystery of good Husbandry a note or two Higher; but to do the same thing by a better way, and to more advantage." (15—XI, 191)

Another scheme of Hartlib's was an "office of address." This was the forerunner of the government bureaus of education and of labor of the present day. It was to be useful to the poor in helping them to find employment and to the employer

in distinguishing the industrious from the idle. It was to give advice concerning matters of education and of spiritual welfare, also. (16—III, 225) Hartlib was the first publicist in England to suggest "a registry to help the poor to employment and to distinguish the industrious from the idle." (17—778)

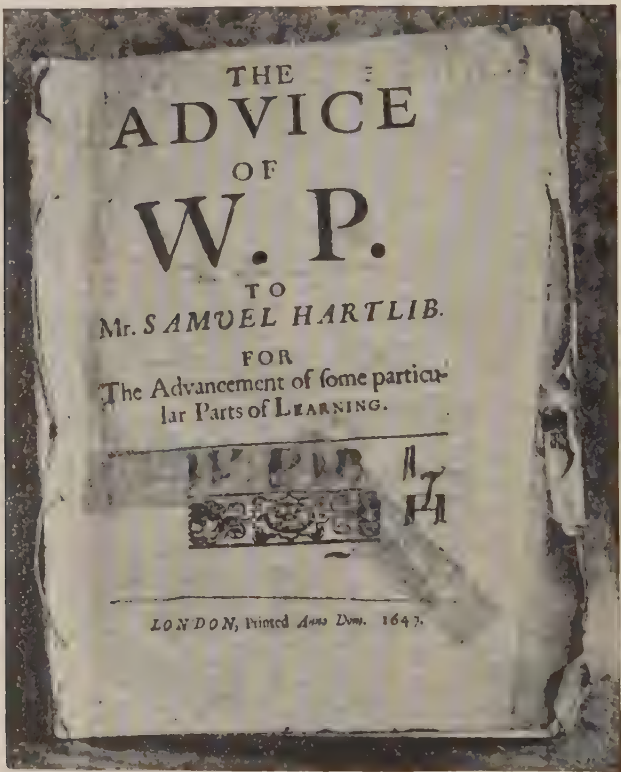


FIG. 1. SIR WILLIAM PETTY'S PAMPHLET ON EDUCATION
In Harvard University Library

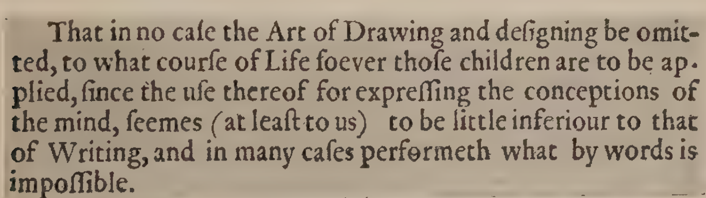
20. **A "Literary Workhouse" Suggested by Petty.** Another friend whom Hartlib induced to write out his ideas on education was Sir William Petty. (13—61) These appeared in a pamphlet printed in London in 1647, entitled *The Advice of W. P. to Mr. Samuel Hartlib for the Advancement of Some Particular Parts of Learning.* (Fig. 1) In this he first com-

mends Hartlib for his proposed scheme of establishing an Office of Public Address. He looks upon it as a means of bringing men of like mind into co-operation to hasten the advancement of learning through discovery, and through more effective methods of education. He then proposes the publishing of a great cyclopedia of the arts and sciences. In the process of compiling this he would have a survey made of all books and mechanical inventions. Having thus sifted and brought together all the known facts of "real and experimental learning," he would have the ablest men in each department of such learning set apart to search for new facts and constantly add to the sum of knowledge.

Concerning education he proposed along with other reforms:

(1) That literary work-houses be established "where children may be taught as well to do something towards their living, as to read and write."

(2) That all children above seven years of age be given this kind of education, none being excluded by reason of poverty, "for hereby it hath come to pass that many are now holding the plow which might have been made fit to steer the State." Children of poor parents might work longer than others if in need of earning.



That in no caſe the Art of Drawing and deſigning be omitted, to what courſe of Life ſoever thoſe children are to be applied, ſince the uſe thereof for expreſſing the conceptions of the mind, ſeemes (at leaſt to us) to be little inferiour to that of Writing, and in many caſes performeth what by words is impoſſible.

Fig. 2. A Paragraph by Petty on the Art of Drawing

(3) "That since few children have need of reading before they know or can be acquainted with the things they read of, or of writing before their thoughts are worth the recording or they are able to put them into any form" that these be deferred awhile and, "in the order of Nature," that children be taught first "to observe and remember all sensible objects and actions, whether they be natural or artificial."

(4) "That they use such exercises, whether in work or for recreation, as tend to the health, agility and strength of their bodies."

(5) "That in no case the art of drawing and designing be omitted, to what course of life soever those children are to be applied, since the use thereof for expressing the conceptions of the mind, seems (at least to us) to be little inferior to that of writing, and in many cases performeth what by words is impossible." (Fig. 2)

(6) That all children, though of the highest rank, be taught "some genteel manufacture in their minority," such as:

Turning of curious figures.
Making mathematical instruments, dials and learning how to use them in astronomical observations.
Making watches and other trochilic motions.
Limning and painting on glass or in oil colors.
Graving, etching, carving, embossing and modeling in sundry materials.
The lapidary's art of knowing, cutting and setting jewels.
Grinding of glass diaptrical and caloptrical.
Botany and gardening.
Making musical instruments.
Navarchy and making models for the building and rigging of ships.
Architecture and making models of houses.
The confectioner's, perfumer's and dyer's arts.
Chemistry, refining metals and counterfeiting jewels.
Anatomy, making skeletons and excarnating bowels.
Making mariner's compasses, globes and other magnetic devices.

And all for these reasons:

1. They will be less liable to be cheated by artificers.
2. They will become more industrious in general.
3. They will certainly do most excellent work, being gentlemen, ambitious to excel ordinary workmen.
4. They, being able to make experiments themselves, may do it with less cost, and more care than others will do it for them.
5. The arts will be much advanced, when such as are rich and able, are also willing to make enlightening experiments.
6. It may engage them to be Patrons of Arts.
7. It will keep them from worse occasions of spending their time and estates.
8. As it will be a great ornament in prosperity, so it will be a great refuge and stay in adversity and common calamity. (18——)

Later in his "advice" Sir William Petty says that just as it would be more profitable for boys to spend ten or twelve years in the study of things and his proposed "Book of Trades," which he describes, than in "a rabble of words," so it would be easier and pleasanter for them, as well as more in accord with their natural "propensions." For children "delight in drums, pipes, fiddles, guns made of elder-sticks and bellows noses, piped keys, etc., and in painting flags and ensigns with elder berries and corn poppy, making ships with paper, and setting even nut-shells a swimming, handling the tools of workmen as soon as they turn their backs, and trying to work themselves, fishing, fowling, hunting, setting springes and

traps for birds, and other animals, making pictures in their writing books, making tops, gigs, and whirligigs, quilting balls, practicing divers jugling tricks with cards, etc., and a million more besides." (18——)

He gives a similar list of activities that are interesting to girls and then adds: "By all which it is most evident, that children do most naturally delight in things, and are most capable of learning them, having quick senses to receive them and unpreoccupied memories to retain them. As for other things whereunto they are now-a-days set, they are altogether unfit, for want of judgement which is but weak in them, and also for want of will, which is sufficiently seen both by what we have said before, by the difficulty in keeping them at school, and the punishment they will endure rather than be altogether debarred from the pleasure which they take in things." (18——)

In addition to his literary work-house for children Petty proposed a college or society or gild of tradesmen. It was to consist of several expert workmen representing different trades grouped together for the double purpose of the production of fine examples of craftsmanship and the advancement of "mechanical arts and manufactures." In this institution he would have written a book laying open the "mysteries of trades." It would also describe in detail the manual processes of each trade. One of the uses of this book would be to enable boys, before they are bound as apprentices to any trade, to "foreknow the good and bad of it, what will and strength they have to it, and not spend seven years in repenting." He thought that an apprentice, having read this book, would need only three years with a master and could spend the other four in travel "to learn breeding and the perfection of his trade." (18——)

More than any of his predecessors, Sir William Petty proposed to connect handwork with the school, though he never put his plan into practice. In his suggested literary work-house he even went so far as to suggest that industrial occupation be an integral part of the school work. He does not seem to recognize the full pedagogical significance of his proposition, yet he did grasp the idea that in learning, the object

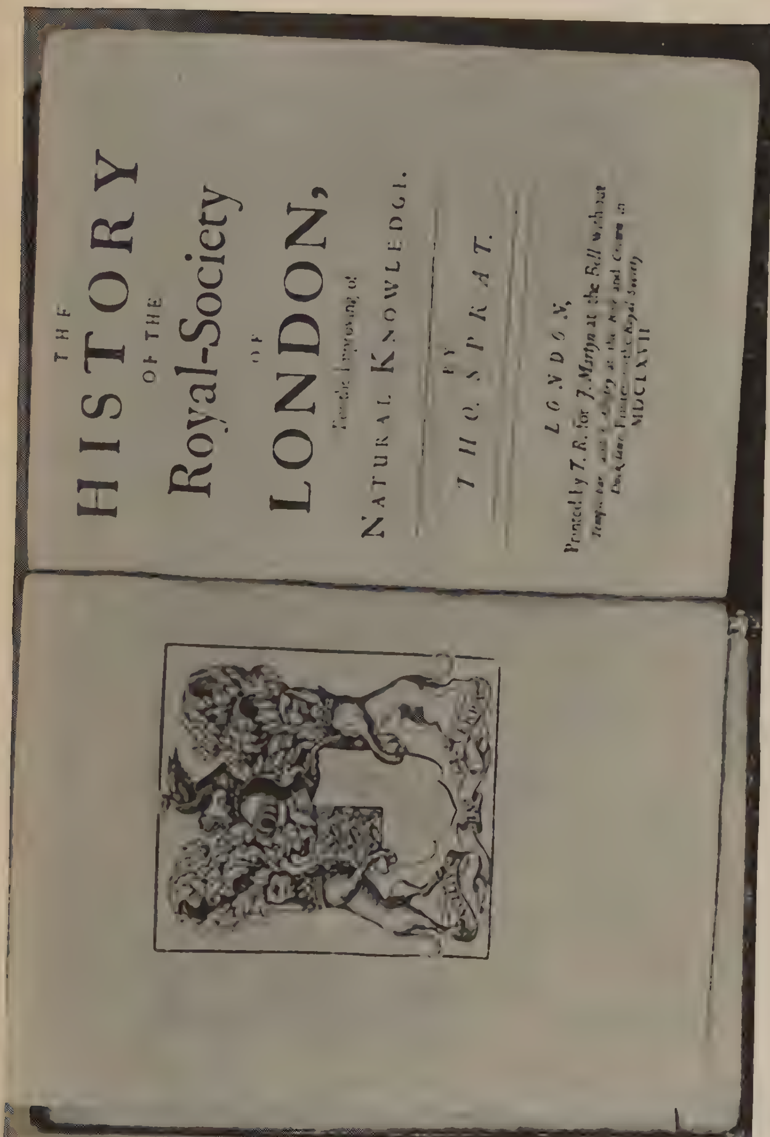
studied—the thing—should precede the symbol of the thing—the written or printed word. He saw, too, that it gave children great pleasure to make and manipulate things with their hands and with tools. He would utilize this natural impulse in the schools.

He recognized the great value of drawing as a means of expression—as a language, and in some cases considered it superior to written language. Therefore he would give drawing, also, a place in the schools.

It is noticeable that Petty's chief aim in placing things and handwork in the school was to further general education and not to produce artisans On the other hand, his efforts toward shortening apprenticeship were not primarily through handwork in the school but through the study of his proposed book of the trades, an idea which may have come from the book on the mechanical arts proposed by Comenius. (cf. 17)

21. **The Aims of the Royal Society of London.** English scholars were slow to apply the teachings of Bacon, but the pursuit of physical science with its "method of research by observation, comparison and experiment" became popular during the last half of the seventeenth century. In 1648 a group of men at Oxford gathered around Dr. John Wilkins (1614–1672), the astronomer, forming an organization which was later known as the Royal Society. (19—610) In this group of men were Sir William Petty, Dr. Christopher Wren (1632–1723), astronomer and, later, famous architect, Robert Boyle (1627–1691), chemist, best known as the discoverer of Boyles' law, and several other kindred spirits. (20—55) Political conditions were unfavorable to the society's progress, but twelve years later, in 1660, when Charles II came to the throne, the study of science became the fashion of the day. "Charles himself was a fair chemist." Several of the more eminent members of the Oxford group came to London and a scientific society was formed to which the king gave the name The Royal Society of London. (19—610)

The full title of this society, as given by its first historian, Tho. Sprat, was "The Royal Society of London for the Improving of Natural Knowledge." (Figs. 3 and 4) At that time the

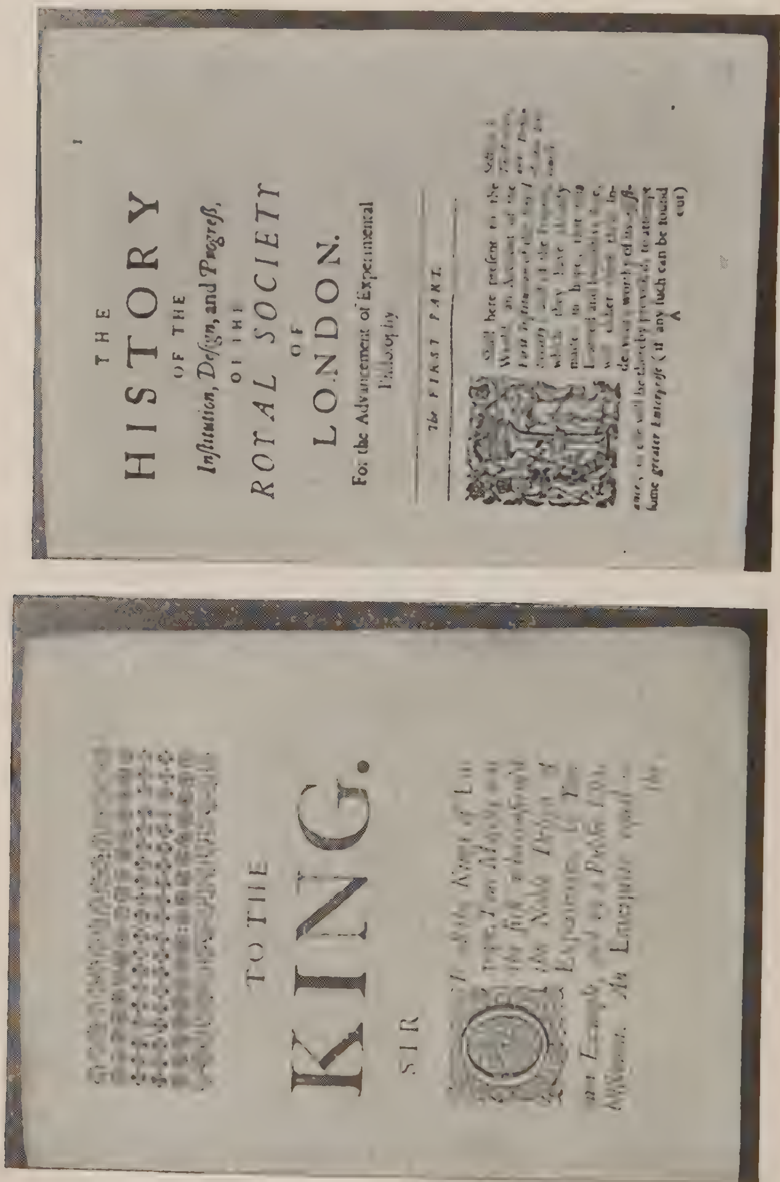


THE
HISTORY
OF THE
Royal-Society
OF
LONDON,
For the Improving of
NATURAL KNOWLEDGE.

BY
THO. SPRAT.

LONDON,
Printed by T. R. for J. Martyn at the Bell without
MDCLXVII

Fig. 3. Title Page and Frontispiece


TO THE

KING.

SIR

THE HISTORY OF THE *Institution, Design, and Progress,* OF THE ROYAL SOCIETY OF LONDON. For the Advancement of Experimental Philosophy.

The FIRST PART.

Fig. 4. First Page of the Dedication and Initial Page of First Part

natural sciences had not been isolated as they are today. It is not strange, therefore, that, in discussing the advantages of the society, no sharp line should have been drawn between the natural sciences and the manual arts. One finds such statements as this: "It would not be amiss, if before young Scholars be far ingag'd in the beaten tracks of the Scholes, the Mysteries of Manual Arts, the names of their Instruments, the secrets of their Operations, the effects of Natural causes . . . were propos'd to be the subjects of their first thoughts and observations." (20—330) In another place the author modestly says:

> "I will venture to propose to the consideration of wise men, whether this way of Teaching by Practise and Experiments, would not at least be as beneficial as the other by Universal Rules? Whether it were not as profitable to apply the eyes, and the hands of Children, to see, and to touch all the several kinds of sensible things, as to oblige them to learn and remember the difficult Doctrines of general Arts? In a word, Whether a Mechanical Education would not excel the Methodical?" (20—329)

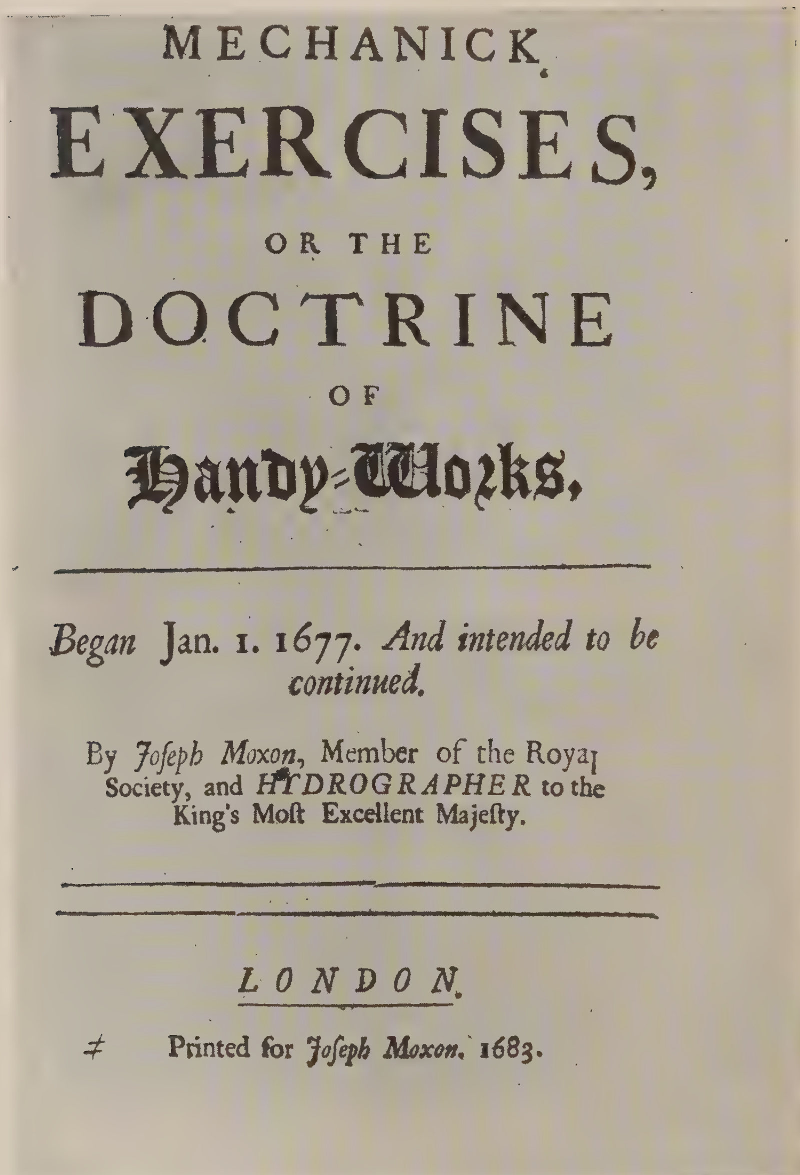
This same writer presents an extended argument to show how the method of experiment will advance the manual arts themselves and at the same time provide a better method in the education of a gentleman.

22. **Moxon's Treatise on Mechanical Processes.** Further evidence of the unity of the manual arts and the natural sciences in the minds of the early members of the Royal Society is found in a remarkable work on the most common and useful of these arts written by Joseph Moxon, hydrographer to the king and member of the Royal Society of London. It was first published as a monthly series of parts beginning on January 1st, 1677. In 1683 the first fourteen of these were brought together into a volume entitled *Mechanick Exercises or the Doctrine of Handy Works.* (Fig. 5) In each part was an engraved plate used as a frontispiece. The subjects of these first fourteen parts were as follows:

I.—Of Smithing in general (Fig. 6 and 7).

II.—Hinges, Locks, Keys, Screws and Nuts—Small and Great.

III.—The making of Jacks, and Bullet Molds, the twisting of Iron, the Case hardening it, with the use of some Tools and treated of before: Also of the several sorts of Steel, the manner of softening, hardening, and tempering them.



MECHANICK EXERCISES, OR THE DOCTRINE OF Handy-Works.

Began Jan. 1. 1677. *And intended to be continued.*

By *Joseph Moxon*, Member of the Royal Society, and *HYDROGRAPHER* to the King's Most Excellent Majesty.

LONDON.

Printed for *Joseph Moxon.* 1683.

FIG. 5. TITLE PAGE, MOXON'S *Mechanick Exercises*
In Newberry Library, Chicago

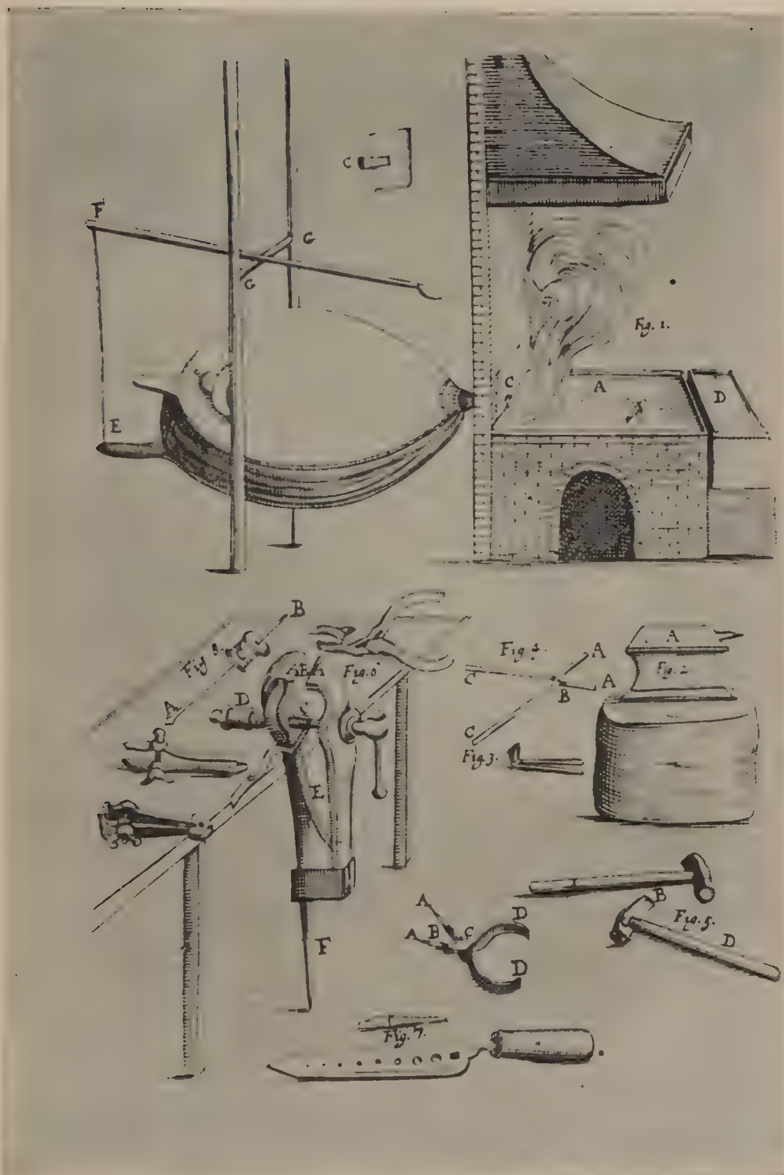


FIG. 6. TOOLS OF SMITHING, MOXON'S *Mechanick Exercises*

Smithing. Numb. I. Fol. 1

MECHANICK EXERCISES,

OR,

The Doctrine of *Handy-Works*.

Of Smithing *in general*.

Definition.

S*Mithing is an Art-Manual, by which an irregular lump (or ſeveral lumps) of Iron is wrought into an intended ſhape.*

This Definition needs no Explanation: therefore I ſhall proceed to give you an account of the Tools a Smith uſes; not but that (they being ſo common) I ſuppoſe you do already know them; but partly becauſe they may require ſome pre-caution in ſetting them up fitteſt to your uſe, and partly becauſe it behoves you to know the Names Smiths call the ſeveral parts of them by, that when I name them in Smiths Language, as I ſhall oft have occaſion to do in theſe *Exerciſes*) you may the eaſier underſtand them as you read them.

Of ſetting up a Smiths Forge.

THe *Hearth*, or Fire-place of the *Fogre* marked A. (in Plate 1.) is to be built up from your floor with Brick about two foot and an half, or ſometimes two foot nine inches high, according to the purpoſe you deſign your *Forge* for: for if your *Forge* be intended for heavy work, your *Hearth* muſt lie lower than it need be for light work, for eaſineſs of management, and ſo broad as you think convenient: It may be built with hollow Arches underneath, to ſet ſeveral things out of the way. The

B Back

FIG. 7. INITIAL PAGE ON SMITHING. FROM MOXON'S *Mechanick Exercises*

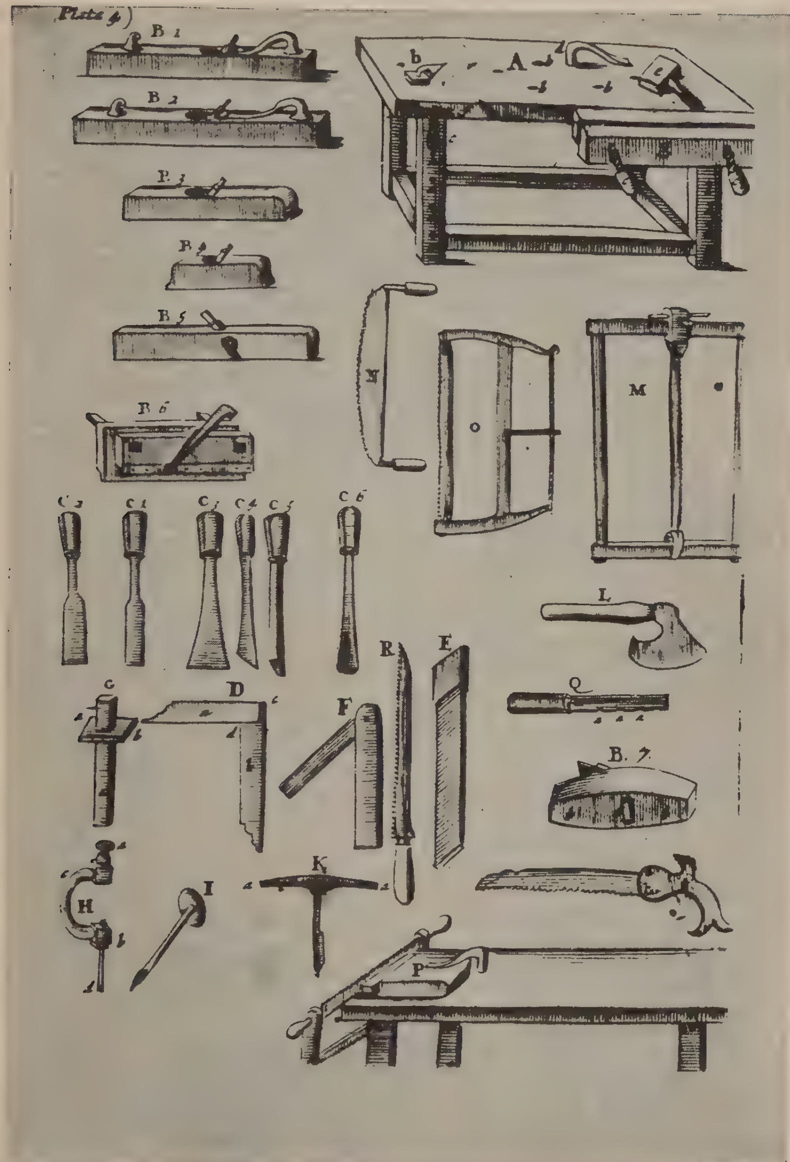


FIG. 8. TOOLS USED IN JOINERY. FROM MOXON'S *Mechanick Exercises*

PREFACE.

I See no more reaſon why the ſordidneſs of ſome Workmen ſhould be the cauſe of contempt upon Manual Operations, than that the excellent Invention of a Mill ſhould be deſpis'd, becauſe a blind Horſe Draws in it. And though the Mechanicks be by ſome accounted ignoble and ſcandalous; yet it is very well known, that many Gentlemen in this Nation of good Rank and high Quality are converſant in Handy-Works: And other Nations exceed us in numbers of ſuch. How pleaſant and healthy this their Divertion is, their Minds and Bodyes find; and how Harmleſs and Honeſt all ſober men may judge?

That Geometry, Aſtronomy, Perſpective, Muſick, Navigation, Architecture, &c. are exellent Sciences, all that know but their very names will confeſs: Yet to what purpoſe would Geometry ſerve, were it not to contrive Rules for Handy-Works? Or how could Aſtronomy be known to any perfection, but by Inſtruments made by Hand? What Perſpective ſhould we have to delight our Sight? What Muſick to raviſh our Ears? What Navigation to Guard and Enrich our Country? Or what Architecture to defend us from the inconveniences of different Weather, without Manual Operations? Or how waſte and uſeleſs would many of the Productions of this and other Countries be, were it not for Manufactures.

To dive into the Original of the Mechanicks is impoſſible, therefore I ſhall not offer at it; Only I ſhall ſay, It is Rational to think that the Mechanicks began with Man, He being the only Creature that Nature has impos'd moſt neceſſity upon to uſe it, endow'd with greateſt Reaſon to contrive it, and adapted with propereſt Members (as Inſtruments) to perform it. Nor

FIG. 9. PREFACE TO MOXON'S *Mechanick Exercises*

Preface.

Nor is it easie to find by any Authority, what part of the Mechanicks was first Practised by Man; Therefore I shall wave that too; and only consider, that if we our selves were the first Men, what Branch of the Mechanicks we should first NEED, and consequently have recourse to.

I have considered, and Answer, That without the Invention of Smithing primarily, most other Mechanick Inventions would be at a stand: The Instruments or Tools that are used in them being either made of Iron, or of some other matter form'd by the help of Iron. But pray take notice, that by Iron I also mean Steel, it being originally Iron.

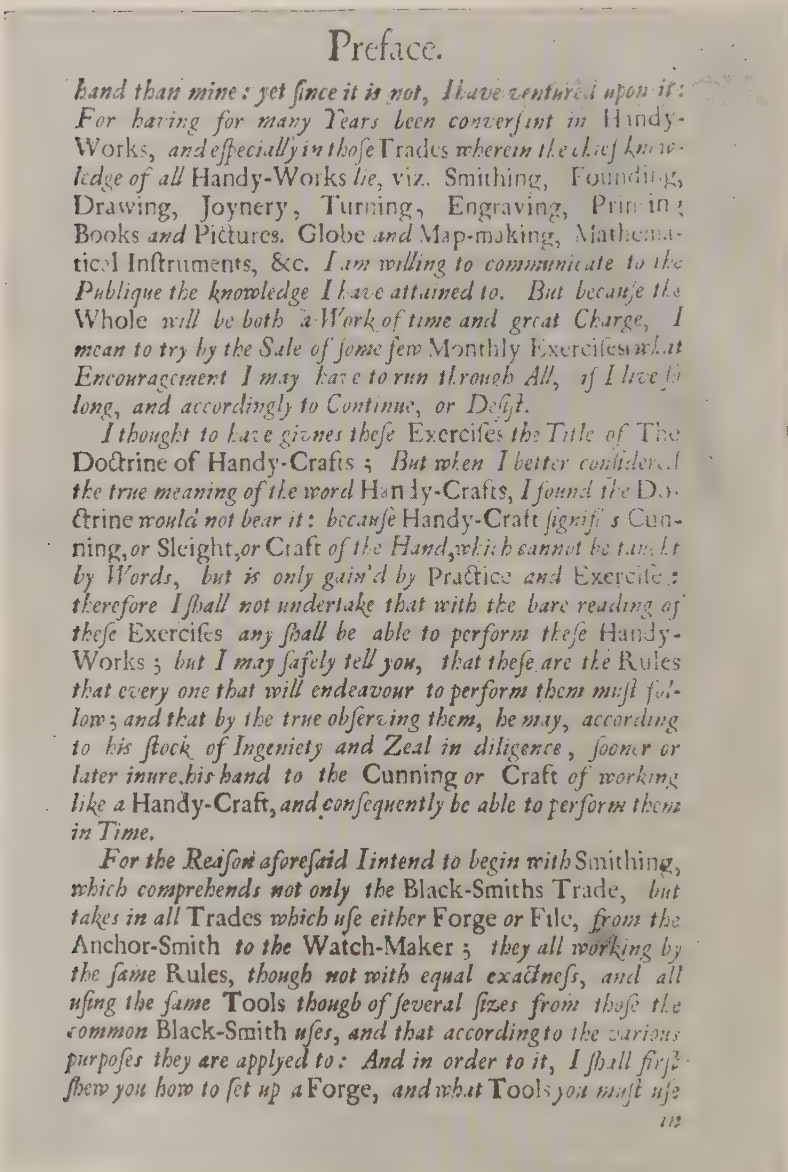
Nor would I have you understand, that when I name the Mechanicks, I mean that rough and Barbarous sort of working which is used by the Natives of America, and some other such Places; For, though they did indeed make Houses, Canoes, Earthen Pots, Bowes, Arrows, &c. without the help of Iron, because they had then none among them; Yet since Iron is now known to them, they leave off their old way of working without it, and betake themselves to the use of it. Nor are at this day (though now they have in part the use of Iron) their Machines made by good and ready Rules of Art; for they know neither of Rule, Square, or Compass; and what they do is done by Tedious Working, and he that has the best Eye at Guessing, works best upon the Straight, Square, or Circle, &c.

The Lord Bacon in his Natural History reckons that Phylosophy would be improv'd by having the Secrets of all Trades lye open; not only Because much Experimental Philosophy is Coutcht among them: but also that the Trades themselves might by a Philosopher be improved. Besides, I find that one Trade may borrow many Eminent Helps in Work of another Trade.

Hitherto I cannot learn that any hath undertaken this Task though I could have wisht it had been performed by an abler

hand.

Fig. 10


Preface.

hand than mine: yet since it is not, I have ventured upon it: For having for many Years been conversant in Handy-Works, and especially in those Trades wherein the chief knowledge of all Handy-Works lie, viz. Smithing, Founding, Drawing, Joynery, Turning, Engraving, Printing Books and Pictures. Globe and Map-making, Mathematical Instruments, &c. I am willing to communicate to the Publique the knowledge I have attained to. But because the Whole will be both a Work of time and great Charge, I mean to try by the Sale of some few Monthly Exercises what Encouragement I may have to run through All, if I live so long, and accordingly to Continue, or Desist.

I thought to have given these Exercises the Title of The Doctrine of Handy-Crafts; But when I better considered the true meaning of the word Handy-Crafts, I found the Doctrine would not bear it: because Handy-Craft signifies Cunning, or Sleight, or Craft of the Hand, which cannot be taught by Words, but is only gain'd by Practice and Exercise: therefore I shall not undertake that with the bare reading of these Exercises any shall be able to perform these Handy-Works; but I may safely tell you, that these are the Rules that every one that will endeavour to perform them must follow; and that by the true observing them, he may, according to his stock of Ingeniety and Zeal in diligence, sooner or later inure his hand to the Cunning or Craft of working like a Handy-Craft, and consequently be able to perform them in Time.

For the Reason aforesaid I intend to begin with Smithing, which comprehends not only the Black-Smiths Trade, but takes in all Trades which use either Forge or File, from the Anchor-Smith to the Watch-Maker; they all working by the same Rules, though not with equal exactness, and all using the same Tools though of several sizes from those the common Black-Smith uses, and that according to the various purposes they are applyed to: And in order to it, I shall first shew you how to set up a Forge, and what Tools you must use

in

FIG. 11

Preface.

in the Black-Smiths *work*; *then the* Rules *and ſeveral* Circumſtances *of* Forging *till your Work come to the* File: *Then of the ſeveral Sorts of Iron that are commonly uſed; and what ſort is fitteſt for each Purpoſe. Afterwards of* Filing *in general, and the* Rules *to be obſerved in it, in the making of* Jacks, Hindges, Screws, Clocks, Watches, &c. *In which Examples you will find all other ſorts of* Forging *or* Filing *work whatſoever comprehended. And laſtly, as a Cloſe to* Smithing *I ſhall Exerciſe upon* Steel, *and its ſeveral Sorts, and how to order and temper it for its ſeveral Uſes; and what ſort is fitteſt for each particular purpoſe; as which is fitteſt for* Edge-Tools, *which for* Springs, *which for* Punches, &c.

Some perhaps would have thought it more Proper to have introduced theſe Exerciſes *with a more Curious and leſs Vulgar Art than that of* Smithing; *but I am not of their opinion: for* Smithing *is (in all its parts) as curious a* Handycraft *as any is: Beſides, it is a great Introduction to moſt other* Handy-works, *as* Joynery, Turning, Founding, Printing, &c. *they (all with the* Smith) *working upon the* Straight, Square, *or* Circle, *though with different* Tools *upon different* Matter; *and they all having dependence upon the* Smiths Trade, *and not the* Smith *upon them. But having done with* Smithing, *I ſhall, God willing, proceed to thoſe and all other* Handy-Works *whatſoever that work by* Geometrical *Principles.*

Joſeph Moxon.

Fig. 12

IV, V, VI.—The Art of Joynery. [In which the tools are described and their theory and use discussed. The first of the plates on this subject is shown in Fig. 8. At the conclusion of the discussion is an "explanation of the terms used among joyners."]

VII, VIII, IX.—The Art of House-Carpentry. [In the first of which such tools as the ax, adz, level, plumb-line, hammer, ten-foot rod, draw-knife, ripping chisel (mortising chisel), commander (mallet), crow (flat bar with claw on one end), etc., were described and their uses discussed. The second treats of framing, and includes the names of each part of the frame of a house. It includes also window frames, stairs and staircases. The third treats further of stairs, including the newel, also of the hanging of windows, and it gives the titles of books on architecture and a list of terms used in carpentry.]

X, XI, XII, XIII, XIV.—The Art of Turning. [Describing and illustrating the hand bow-lathe, the foot-power bow-treadle lathe, the foot-power wheel-and-treadle lathe, the lathe with the great wheel for heavy work, requiring a second person to turn the wheel from which a belt or cord turns the lathe spindle. In these monographs there are described a greater number of lathe tools than are used by turners today.]

In the preface to the first bound volume (Figs. 9, 10, 11, and 12), 1683, Moxon says that he does not know of any previous treatise of this character. We may therefore believe that it is the earliest treatise of any importance on tools and their use in the English language. It is, however, much more than a book such as might be written by a mechanic of that time; it is the work of a scientist and scholar who is also an expert in handwork, having, as he says, done smithing, founding, drawing, joinery, turning, engraving and he has printed books and pictures and made globes, maps and mathematical instruments. (21—Preface)

The second volume is on printing and consists of 24 parts, 394 pages, and 33 plates—a most comprehensive and excellent treatise.

23. **John Locke Includes the Manual Arts in His Scheme of Education.** The establishment of the Royal Society of London marks the opening of a great age of scientific discovery in England. Before the end of the century Sir Isaac Newton (1642–1727) had discovered the law of gravitation and Robert Boyle had invented the air pump. Experimental chemistry, mineralogy, zoology, and botany had been established among the sciences; marked progress had been made in astronomy, and in microscopic research; physiological researches had thrown light on the structure of the brain, and new observa-

tions and facts had "changed the whole face of medicine." (19—611) This development in the field of natural science had its effect upon philosophical thinking. As one of the most striking products of this period came the writings of John Locke (1632–1704). He was a man of marked individuality; he was "independent of party or school or authority." In 1690 he published his *Essay on the Human Understanding*, which is regarded as "the corner-stone of modern empirical psychology" (17—995), and in 1693 his *Some Thoughts Concerning Education*. These two volumes placed Locke in the highest rank among educationists. In this connection it is significant that Locke became a Fellow of the Royal Society in 1668 and took a degree in medicine in 1674. He was therefore educated in the atmosphere of the new scientific thinking.

"Locke became the chief exponent of the idea that education should fit a boy for practical life," whether it be in a trade or a profession. "In 1697, when he was a commissioner of trade and plantations, he advocated a system of 'working schools' for all pauper children between three and fourteen years of age, where they were to be taught 'spinning or knitting, or some other part of the woollen manufacture.' This useful training, together with church-going and religious training, was a minimum educational training in accordance with all Locke's pedagogy, which insisted on individual exercise in habits of practical usefulness, and habits of thinking and forming tested judgments, as more important educationally than instruction in the established subjects of the curriculum. He pronounced 'learning' as the 'least part' of education: virtue, wisdom, manners being three higher aims." (17—994)

Locke's *Some Thoughts on Education* was written as a series of letters to a friend who desired some advice concerning the education of his son. The fact that this friend was a nobleman and that the education recommended was intended for an English gentleman has often led to the conclusion that Locke was not democratic; but it has been pointed out that the principles behind the details of his scheme are capable of general application. (17—994)

These remarkable letters set forth in specific terms the author's viewpoint in reference to the numerous problems that arise in the education of a son. They might be called "the applied science of education according to Locke." Physical education is discussed under sixteen headings, moral under sixty-four, intellectual under twenty-nine, and under nine more headings are "exercises combining the various departments of education." It is in this latter section that he recommends the learning of one or more manual trades, preferably two or three. He especially approves of gardening and woodworking for a country gentleman. He advocates learning the manual trades (a) because they afford good physical exercise; (b) because the skill gained is worth having—it may be useful; (c) because they provide diversions or recreations. (Source Material II, B)

Under intellectual education he would have the young man learn drawing—"so much insight into perspective, and skill in drawing, as will enable him to represent tolerably on paper anything he sees, except faces." However, he did not consider it to be "in the things absolutely necessary" and therefore, it was one of those things that it is better to let him pass by quietly than "to vex him about" to no purpose.

24. **Thomas Budd's Plan for Public Schools in America.** A very progressive scheme of public education was proposed for Pennsylvania and New Jersey as early as 1685. This would make education compulsory for all children alike—for the rich, the poor, and the Indians. It would include teaching each child that "Art, Mystery or Trade that he or she most delighteth in." This scheme was proposed by Thomas Budd, a Quaker, who came to New Jersey from England in 1683 and later became a merchant in Philadelphia. In 1685 he published "a small treatise," entitled *Good Order Established in Pennsylvania and New Jersey in America,* in which he proposed a scheme of education. Although there is no evidence that it was carried into practice as planned, it is easy to believe that its publication had some effect upon the early demand of the people for free public schools. His scheme is outlined as follows:

1. Now it might be well if a Law were made by the Governours and General Assemblies of Pennsilvania and New Jersey, that all Persons inhabiting in the said Provinces do put their Children seven years to the publick School, or longer, if the Parents please.

2. That Schools be provided in all Towns and Cities, and Persons of known honesty, skill, and understanding, be yearly chosen by the Governour and General Assembly, to teach and instruct Boys and Girls in all the most useful Arts and Sciences that they in their youthful capacities may be capable to understand, as the learning to Read and Write true English, Latine, and other useful Speeches and Languages, and fair Writing, Arithmatick, and Book-keeping; and the Boys to be taught and instructed in some Mystery or Trade, as the making of Mathematical Instruments, Joynery, Turnery, the making of Clocks and Watches, Weaving, Shoemaking, or any other useful Trade or Mystery that the School is capable of teaching, and the Girls to be taught and instructed in Spinning of Flax and Wool, and Knitting of Gloves and Stockings, Sewing, and making of all sorts of useful Needle-Work, and the making of Straw-Work, as Hats, Baskets, etc., or any other useful Art or Mystery that the School is capable of teaching.

3. That the Scholars be kept in the Morning two hours at Reading, Writing, Book-keeping, etc., and the other two hours at work in that Art, Mystery or Trade that he or she *most delighteth in;* and then let them have two hours to dine and for Recreation, and in the afternoon two hours at Reading, Writing, etc., and the other two hours at work at their several Imployments.

4. The seventh day of the Week the Scholars may come to school only in the fore-noon, and at a certain hour in the afternoon let a Meeting be kept by the Schoolmasters and their Scholars, where after good instruction and admonition is given by the Masters to the Scholars, and thanks returned to the Lord for his Mercies and Blessings that are daily received from him, then let a strict examination be made by the Masters of the Conversation of the Scholars in the week past, and let reproof, admonition, and correction be given to the Offendors, according to the quantity and quality of their faults.

5. Let the like Meetings be kept by the School-Mistrisses, and the Girls apart from the Boys. By strictly observing this Good Order, our Children will be hindred of running into that Excess of Riot and Wickedness that youth is incident to, and they will be a comfort to their tender Parents.

6. Let one thousand Acres of Land be given and laid out in a good place, to every publick School that shall be set up, and the Rent or incom of it go towards the defraying of the charge of the School.

7. And to the end that the Children of poor People and the Children of Indians may have the like good Learning with the Children of Rich People, let them be maintained free of charge to their Parents, out of the Profits of the school, arising by the Work of the Scholars by which the Poor and the Indians as well as the Rich, will have their Children taught, and the Remainder of the Profits, if any be, to be disposed of to the building of School-houses, and Improvements on the thousand Acres of Land, which belongs to the School.

The manner and Profits of a Spinning-School in Germany, as it is laid down by Andrew Yarenton in his own words, in a book of his call'd "England's Improvements by Sea and Land," take as followeth: "In Germany, where

the Thred is made that makes the fine Linnens, in all Towns there are Schools for little Girls, from six years old and upwards, to teach them to spin, and so to bring their tender fingers by degrees to spin very fine; their Wheels go all by the Foot, made to go with much ease, whereby the action or motion is very easie and delightful. The way, method, rule, and order, how they are governed is: 1st. There is a large Room, and in the middle thereof a little Box like a Pulpit: 2ndly. There are Benches built around about the Room, as they are in Play-houses; upon the benches sit about two hundred Children spinning, and in the box in the middle of the Room, sits the grand-Mistress with a long white Wand in her hand; if she observe any of them idle, she reaches them a tap, but if they will not do, she rings a bell, which by a little Cord is fixed to the box, and out comes a Woman, she then points to the Offendor, and she is taken away into another Room and chastized; and all this is done without one word speaking. In a little Room by the School there is a Woman that is preparing and putting Flax on the Distaffs, and, upon the ringing of a Bell, and pointing the Rod at the Maid that hath spun off her Flax, she hath another Distaff given her and her Spool of Thred taken from her, and put into a box unto others of the same size, to make Cloth, all being of equal Threds. 1st. They raise their Children as they spin finer, to the higher Benches. 2. They sort and size all the Threds, so that they can apply them to make equal Cloths; and after a young Maid hath been three years in the Spinning-School, that is taken in at six, and then continues until nine years, she will get eight pence the day, and in these parts I speak of, a man that has most Children lives best." (22–XXXI, 608–611)

SOURCE MATERIAL II, A

The Method of the Arts by Comenius

From *The Great Didactic of Comenius* by M. W. Keatinge

1. "Theory," says Vives, "is easy and short, but has no result other than the gratification that it affords. Practice, on the other hand, is difficult and prolix, but is of immense utility." Since this is so, we should diligently seek out a method by which the young may be easily led to the practical application of natural forces, which is to be found in the arts.

2. Art primarily requires three things: (1) A model or a conception; that is to say, an external form which the artist may examine and then try to imitate. (2) The material on which the new form is to be impressed. (3) The instruments by the aid of which the work is accomplished.

3. But when the instruments, the materials, and the model have been provided, three more things are necessary before we can learn an art: (1) a proper use of the materials; (2) skilled guidance; (3) frequent practice. That is to say, the pupil should be taught when and how to use his materials; he should be given assistance when using them that he may not make mistakes, or that he may be corrected if he do; and he should not leave off making mistakes and being corrected until he can work correctly and quickly.

4. With respect to these points eleven canons must be observed: six on the use of materials; three on guidance; and two on practice.

5. (i) *What has to be done must be learned by practice.*

Artisans do not detain their apprentices with theories, but set them to do practical work at an early stage; thus they learn to forge by forging, to carve by carving, to paint by painting, and to dance by dancing. In schools, therefore, let the students learn to write by writing, to talk by talking, to sing by singing, and to reason by reasoning. In this way schools will become workshops humming with work, and students whose efforts prove successful will experience the truth of the proverb: "We give form to ourselves and to our materials at the same time."

6. (ii) *A definite model of that which has to be made must always be provided.*

This the student should first examine, and then imitate, as though he were following in the footsteps of a guide. For he who neither knows what has to be done nor how to do it, is unable to produce anything of himself, but must have a model placed before him. Indeed it is sheer cruelty to force any one to do what you wish, while he is ignorant what your wishes are; to demand, that is to say, that he forms straight lines, right angles, or perfect circles, unless you first give him a ruler, a square, and a pair of compasses, and explain their use to him. Further, great care should be taken to provide in the schoolroom formulae for or models of everything that has to be made, and these, whether drawings and diagrams, or rules and models, should be correct, definite, and simple; easy both to understand and to imitate. There will then be no absurdity in demanding of a man that he see, when provided with a light; that he walk, when he already stands on his feet; or that he use the tools that are already in his hands.

7. (iii) *The use of instruments should be shown in practice and not by words; that is to say, by example rather than by precept.*

It is many years since Quintilian said "Through precepts the way is long and difficult, while through examples it is short and practicable." But alas, how little heed the ordinary schools pay to this advice. The very beginners in grammar are so overwhelmed by precepts, rules, exceptions to the rules, and exceptions to the exceptions, that for the most part they do not know what they are doing, and are quite stupefied before they begin to understand anything. Mechanics do not begin by drumming rules into their apprentices. They take them into the workshop and bid them look at the work that has been produced, and then, when they wish to imitate this (for man is an imitative animal), they place tools in their hands and show them how they should be held and used. Then, if they make mistakes, they give them advice and correct them, often more by example than by mere words, and, as the facts show, the novices easily succeed in their imitation. For there is great truth in that saying of the Germans, "A good leader finds a good follower." Very apposite, too, is the remark of Terence, "Do you go before, I will follow." This is the way, namely, by imitating, and without any laborious rules, that children learn to walk, to run, to talk, and to play. Rules are like thorns to the understanding, and to grasp their meaning needs both attention and ability, while even the dullest students are aided by example. No one has ever mastered any language or art by precept alone; while by practice this is possible even without precept.

8. (iv) *Practice should commence with the rudiments and not with ambitious works.*

A carpenter does not begin by teaching his apprentice to build turrets, but first shows him how to hold the axe, to cut down trees, to shape planks, to bore holes, and to fasten beams together. A painter does not make his pupil commence by painting portraits, but teaches him how to mix colours, to hold the brush, and to make lines; then to attempt rough outlines, and so on. . . . If any one advance step by step in any art, as here indicated, it is impossible that he should not make progress. . . .

9. (v) *Beginners should at first practise on a material that is familiar to them.* . . .

10. (vi) *At first the prescribed form should be imitated with exactness. Later on more freedom may be allowed.*

A form will be expressed with more exactness in proportion as care is taken to make it resemble its original. Thus coins that are struck by one die are exactly like the die and one another. So also with books printed from metal type, and with casts made in wax, plaster, or metal. In all other artistic operations, therefore, as far as is possible, any imitation (at any rate the first) should be an exact copy of its original, until the hand, the mind, and the tongue gain more confidence, and can produce good imitations by working freely on their own lines. For instance, those who learn writing take a thin and transparent sheet of paper, place it over the copy that they wish to imitate, and thus can easily form the letters that show through. Or the characters may be printed very faintly on a white page, so that the pupil may go over them with pen and ink, and in this way may easily acquire the habit of shaping them. . . .

11. (vii) *The models of the objects that have to be produced must be as perfect as is possible, so that if any one exercise himself sufficiently in imitating them it will be possible for him to become perfect in his art.*

It is impossible to draw straight lines with a curved ruler, and in the same way a good copy cannot be made from a bad model. Great care should therefore be taken that models be prepared of everything that is to be done in school, or indeed in life, and that these be exact, simple and easy to imitate. They may be either models, pictures and drawings, or precepts and rules; but all must be very short, very clear, self-evident, and absolutely correct.

12. (viii) *The first attempt at imitation should be as accurate as possible, that not the smallest deviation from the model be made.*

That is to say, as far as is possible. For whatever comes first is, as it were, the foundation of that which follows. If the foundation be firm, a solid edifice can be constructed upon it, but if it be weak this is impossible. According to the observations of physicians, the initial defects of digestion cannot be repaired later on, and similarly in any operation an error at the beginning vitiates all that follows. For this reason Timotheus the musician used to demand twice as large a fee from those pupils who had learned the rudiments of their art elsewhere, saying that his labour was twofold, as he had first to get them out of the bad habits that they had acquired, and then to teach them correctly. Those, therefore, who are learning any art should take care to make themselves masters of the rudiments by imitating their copies accurately. This difficulty once overcome, the rest follows of itself, just as a city lies at the mercy of foes when its gates are broken in. All haste should be avoided, lest we proceed to advanced work before the elementary stages have been mastered. He goes fast enough who never quits the road, and a delay which is caused by obtaining a thorough grip of first principles is really no delay, but an advance towards mastering what follows with ease, speed, and accuracy.

13. (ix) *Errors must be corrected by the master on the spot; but precepts, that is to say the rules, and the exceptions to the rules, must be given at the same time.*

Hitherto we have urged that the arts be taught rather by example than by precept; we now add that precepts and rules must be given as well, that they may guide the operations and prevent error. That is to say, the less obvious points of the model should be clearly explained, and it should be made evident how the operation should begin, what it should aim at, and how that aim can be realised. Reasons should also be given for each rule. In this way a thorough knowledge of the art, and confidence and exactness in imitating will be attained.

But these rules should be as short and as simple as possible, since we do not want to grow gray while acquiring them. When once mastered they should be of perpetual use, even when laid aside, just as knee-bands are of use to a child who is learning to walk, and, though they are afterwards discarded, the advantage derived from them remains.

14. (x) *The perfect teaching of art is based on synthesis and analysis.*

We have already shown by examples taken from nature and the workshop that in this relation synthesis is more important. The following points in addition will show that synthetic exercises should generally come first. (1) We should always commence with what is easy, and our own efforts are easier to understand than those of other people. (2) Writers take pains to conceal the artifices by which their results are obtained, so that at first the student finds difficulty in understanding what he sees, or fails to do so altogether.

This difficulty would be removed if he began by practising on his own attempts, which are void of artifice. (3) The chief thing aimed at should be given the chief place in practice, and our real aim is to accustom the student of art to produce original work, and not merely to copy what is placed before him.

15. For all this, the accurate analysis of the work of others must not be neglected. It is only by continually traversing it that we get to know a road, its by-paths, and its cross-roads. Besides, the variety that exists in nature is so great that it is impossible for rules to cover it or for one mind to master it. Many processes require many rules to express them, and these we can only learn if we analyse and study, and by imitation and emulation put ourselves in a position to produce similar results.

16. It is our wish then that in each art complete and exact models or examples of everything that can be produced in that art be supplied to the student. Precepts also and rules should be given him to help to carry out the processes, to guide his efforts at imitation, to show him how to avoid making faults, and to correct them when made. Then other and different models should be given him, and these he should learn to classify and compare with the models that he has already used, and by copying a model that is like one previously used to produce work that resembles the original. After this, the finished works of other artists (who must be well known) may be examined and analysed in accordance with the models and rules that are already familiar. In this way the student will learn to employ the rules with greater ease, and will acquire the art of concealing his art. Only after a course of exercises of this kind will he be in the position to criticise artistic productions, whether his own or those of others.

17. (xi) These exercises must be continued until artistic production becomes second nature.

For it is practice, and nothing else, that produces an artist. (9—346–354)

SOURCE MATERIAL II, B

Locke's Estimate of the Manual Arts

From *Some Thoughts Concerning Education* by John Locke

195. *Manual Trade.* I have one thing more to add, which as soon as I mention, I shall run the danger of being suspected to have forgot what I am about, and what I have above written concerning education, all tending towards a gentleman's calling, with which a trade seems wholly to be inconsistent. And yet, I cannot forbear to say, I would have him learn a trade, a manual trade; nay, two or three, but one more particularly.

196. The busy inclination of children being always to be directed to something that may be useful to them, the advantages proposed from what they are set about may be considered of two kinds: 1. Where the skill itself, that is got by exercise, is worth the having. Thus skill not only in languages, and learned sciences, but in painting, turning, gardening, tempering, and working in iron, and all other useful arts, is worth the having. 2. Where the exercise itself, without any consideration, is necessary or useful for health. Knowledge in some things is so necessary to be got by children, whilst they are young, that some part of their time is to be allotted to their improvement

in them, though those employments contribute nothing at all to their health: such are reading, and writing, and all other sedentary studies, for the cultivating of the mind, which unavoidably take up a great part of gentlemen's time, quite from their cradles. Other manual arts, which are both got and exercised by labour, do many of them by that exercise, not only increase our dexterity and skill, but contribute to our health too; especially such as employ us in the open air. In these, then, health and improvement may be joined together; and of these should some fit ones be chosen, to be made the recreations of one, whose chief business is with books and study. In this choice the age and inclination of the person is to be considered, and constraint always to be avoided in bringing him to it. For command and force may often create, but can never cure an aversion; and whatever any one is brought to by compulsion, he will leave as soon as he can, and be little profited and less recreated by, whilst he is at it.

197. *Painting.* That which of all others would please me best would be a painter, were there not an argument or two against it not easy to be answered. First, ill painting is one of the worst things in the world; and to attain a tolerable degree of skill in it requires too much of a man's time. If he has a natural inclination to it, it will endanger the neglect of all other more useful studies, to give way to that; and if he have no inclination to it, all the time, pains, and money that shall be employed in it, will be thrown away to no purpose. Another reason why I am not for painting in a gentleman, is because it is a sedentary recreation, which more employs the mind than the body. A gentleman's more serious employment, I look on to be study; and when that demands relaxation and refreshment, it should be in some exercise of the body, which unbends the thought and confirms the health and strength. For these two reasons I am not for painting.

198. *Gardening. Joinery.* In the next place, for a country gentleman, I should propose one, or rather both these: viz. gardening or husbandry in general, and working in wood, as a carpenter, joiner, or turner; these being fit and healthy recreations for a man of study or business. For since the mind endures not to be constantly employed in the same thing or way; and sedentary or studious men should have some exercise, that at the same time might divert their minds, and employ their bodies; I know none that could do it better for a country gentleman than these two, the one of them affording him exercise, when the weather or season keeps him from the other. Besides that, by being skilled in the one of them, he will be able to govern and teach his gardener; by the other, contrive and make a great many things both of delight and use: though these I propose not as the chief ends of his labour, but as temptations to it; diversion from his other more serious thoughts and employments, by useful and healthy manual exercise, being what I chiefly aim at in it.

199. The great men among the ancients understood very well how to reconcile manual labour with affairs of state, and thought it not lessening to their dignity to make the one the recreation to the other. That indeed which seems most generally to have employed and diverted their spare hours was agriculture. Gideon amongst the Jews was taken from threshing, as well as Cincinnatus amongst the Romans from the plough, to command the armies of their countries against their enemies; and it is plain their dexterous

handling of the flail, or the plough, and being good workmen with these tools, did not hinder their skill in arms, not make them less able in the arts of war or government. They were great captains and statesmen as well as husbandmen. Cato major, who had with great reputation borne all the great offices of the commonwealth, has left us an evidence under his own hand how much he was versed in country affairs; and, as I remember, Cyrus thought gardening so little beneath the dignity and grandeur of a throne, that he showed Xenophon a large field of fruit-trees, all of his own planting. The records of antiquity, both amongst Jews and Gentiles, are full of instances of this kind, if it were necessary to recommend useful recreations by examples.

200. *Recreation.* Nor let it be thought, that I mistake, when I call these or the like exercises of manual arts, diversions or recreations; for recreation is not being idle (as every one may observe), but easing the wearied part by change of business: and he that thinks diversion may not lie in hard and painful labour, forgets the early rising, hard riding, heat, cold and hunger of huntsmen, which is yet known to be the constant recreation of men of the greatest condition. Delving, planting, inoculating, or any the like profitable employments, would be no less a diversion, than any of the idle sports in fashion, if men could but be brought to delight in them, which custom and skill in a trade will quickly bring any one to do. And I doubt not but there are to be found those, who, being frequently called to cards, or any other play, by those they could not refuse, have been more tired with these recreations than with any of the most serious employment of life: though the play has been such as they have naturally had no aversion to, and with which they could willingly sometimes divert themselves. (23—244–248)

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CHAPTER III

Hand Training a Means of Mental Training

25. **Practical Experiments Grow out of Theoretical Discussions.** In the previous chapter an effort was made to trace out the manual arts thread of educational thought running through the sixteenth and seventeenth centuries. This thought concerning the manual arts resulted, in the eighteenth century, in several practical experiments; and in the nineteenth in the manual arts becoming an integral part of public education.

From what has been said it is clear that many educational leaders included the manual arts in their theories but not in their practice. Luther proposed a system of education for industrial workers but it was not put into operation; Comenius extended and modified Luther's scheme, but only a very small part of it was carried into operation under his direction; Hartlib, Petty, and Locke had visions of manual work as a means of improving methods of education and of giving it a more scientific and practical content. With the exception of teaching drawing, all the theorizing of the sixteenth and seventeenth centuries resulted in those centuries merely in a change of educational philosophy and not a change in school work so far as the manual arts were concerned. This change in philosophy, however, was important and bore fruit later, but during these centuries the manual arts did not, with a very few exceptions, come within the walls of the schoolroom. The idea of "learning by doing" was accepted by many, but not put into practice in the school. The school and the workshop were two entirely separate spheres of human activity. Manual work was outside the realm of school work because its fundamental educational value was not yet recognized.

A noteworthy exception to this statement is found in the case of Erhard Weigel (———–1699), of Jena, whose work seems to have been a link between Comenius and Froebel. In his

"School of Virtue" he used handwork "for the purpose of sweetening the process of learning." "It is very significant that he wished the children to be instructed to build with small boards and blocks, to make figures out of paper or pasteboard, to form models out of paper and wood, to construct sundials, to measure heights and distances, etc. In all these requirements there is plainly expressed a thorough understanding of the necessity of activity for the youth, as well as an appreciation of the kind of instruction which should be established to fulfill this need." (1—33)

What at first thought might seem to be another exception to the statement that up to the eighteenth century the school and the workshop were quite separate is the early Franciscan schools in New Mexico, but a more careful study of the meagre accounts of these industrial schools reveals that they were a degraded form of the monastic schools of Europe (cf. 10), intended to meet a special set of conditions found among the Indians in the New World. It is supposed that "up to nine years of age, the children were taught reading, writing, catechism, singing, and playing on musical instruments." "From nine years of age on, the work of the pupils in school was almost wholly industrial. The common arts and trades of the civilized world formed the curriculum—tailoring, shoemaking, carpentering, carving, blacksmithing, brickmaking, stonecutting. The girls were taught to sew and to spin." (2—42) The Indians were naturally skilful, and the missionaries made the most of this in their economic system. At first the missionaries were the teachers, but later the most skilled of the native artisans took their places. As early as 1630 there were "over 60,000 Christian natives in New Mexico, in 90 pueblos, grouped in 25 missions" and "many of these pueblos had schools." All these schools together with their records were destroyed in the rebellion in 1680.

A few years later the Franciscan friars established similar schools in Texas. "The girls were instructed in household arts while the boys spent the greater part of their time at work in the shops or in the fields learning agriculture and stock raising. There was general instruction for all once a day, at

least, which was chiefly catechetical in character. Little attention was given to the study of the ordinary school subjects. The ideal was that of an industrial training, pure and simple." (2—47)

The schools in the California missions were similar in character. The following from the diary of Father Font who visited the San Gabriel Mission in 1776 reveals something of the character of these schools:

> The discipline of every day is this: in the morning at sunrise, Mass is said regularly, and in this, or without it if it is not said, all the Indians join together, and the padre recites them all the Christian doctrine, which is finished by singing the Alabado, which is sung in all the missions in one way and in the same tone, and the padres sing it even though they may not have good voices, inasmuch as uniformity is best. Then they go to breakfast on the mush (atole) which is made for all, and before partaking of it they cross themselves and sing the Benedito; then they go to work at whatever can be done, the padres inclining them and applying them to the work by setting an example themselves; at noon they eat their soup (pozolo) which is made for all alike; then they work another stint; and at sunset they return to recite doctrine and end by singing the Alabado. (2—55)

The work was such as was required to maintain the institution. There were orchards, and pastures and fields of grain to be cared for; there was food and clothing to be provided and buildings to be erected and furnished. Shops were provided for the various crafts such as weaving, carpentry, blacksmithing, soap and candle making, hat, shoe and rug making. Most of the work in these industries was directed by the padres and its quality was comparatively crude, yet some of the Indians "developed into good carpenters and wood-carvers, making the confessionals, altars, pulpits, and other church furniture, as well as tables, benches, chairs, cupboards, and chests used in other parts of the missions." Some became sufficiently skilled as blacksmiths to make "farm implements, locks, keys, hinges, spurs, scissors, cattle-brands, and bells." Some of the wrought iron grilles made in the missions bear witness to the fact that, in addition to the requisite mechanical skill, a few of these Indian metalworkers developed a fine sense of beauty. In leather work—"braided, carved, or polished"—they rivalled their teachers who were sent from Mexico. (3—52–62) On the whole, however, the education

was almost entirely of a religious nature, being considered by the padres merely the road to right living. (3—63)

In Florida, also, the priests endeavored to teach the Indians "how to cultivate the soil and the simpler forms of handiwork and manufacture." Their methods were essentially the same as in California. (4—22)

In Europe during the eighteenth century two important steps forward were taken: (1) a few schoolmasters took the manual work into the school and began to use it as a means in education, though more of them used it for economic reasons, and (2) at least one writer, Rousseau, in his *Emile*, came nearer than any previous writer to estimating the manual arts at their true educational value.

26. **The Francke Institute and Its Influence.** In 1694 August Hermann Francke (1663–1727), professor of Oriental languages at the University of Halle, and pastor of a church in a suburb of Halle, was in the habit of giving out weekly allowances of bread to the poor people in front of his home. One day he invited some of them into the house and asked them questions out of Luther's catechism to find out what they knew about religion. Then he offered prayer and gave them their usual allowances. (5—19) He was surprised to find how little they knew about Christianity. He therefore formed the children of these poor people into classes to give them religious instruction. In order to help pay the expenses of instruction he hung out a poor-box for contributions. One morning, on finding seven florins in the box, he decided to found a permanent school. (6—321) Out of this school there gradually developed a great institution, including not only a school for poor children, but also a Latin school for the well-to-do, a seminary for training teachers, a publishing house especially to print inexpensive copies of the Bible, and several other departments. This institution became the educational center of the Pietist Movement in the Lutheran Church that spread all over Germany.

Francke's primary aim was always to provide religious education for the poor and neglected children. His orphanage, therefore, became the most important part of his institu-

tion. But besides religious instruction, he gave practical instruction, including several manual arts. (7—643) He observed that children "of their own accord are always busy at building and working, and that this may very easily be turned to some useful end by a teacher." (8—129) His orphans were taught to spin and sew and knit (even the boys were taught to knit). No doubt this was done in part for economic reasons (1—34), yet he says that "the children should not work for the making of as many objects as possible, but they should work for their own development." (8—130)

The well-to-do children in the Latin School were provided with a botanical garden; a natural history cabinet, "a chemical laboratory," philosophical apparatus and "conveniences for anatomical dissections," also turning lathes, and apparatus for glass cutting. Instruction in painting was added in 1709. (9—V, 451) This handwork was given "in the hours of diversion." (9—V, 452) It "prevented idleness and childish amusements." (1—35)

As early as the beginning of the eighteenth century some of the men who were working under Francke recognized the need for a new type of secondary school giving emphasis to science, art, and the trades and industries—one quite different from the usual classical school or *Gymnasium.* They therefore organized a curriculum which included mathematics, mechanics, natural science, and handicrafts. (10—133) A few years later one of the foremost of these teachers under Francke, Johann Julius Hecker (1707–1768), went to Berlin, where, in 1747, he founded what was known as the Royal *Realschule.* The purpose of this school was that "not mere words should be taught to the pupils, but realities, explanations being made to them from nature, from models and plans, and of subjects calculated to be useful in after life." The school was, therefore, called a real school or a *Realschule.* (11—152) The curriculum of this school included drawing, mathematics, science, and history as well as modern languages and Latin. In connection with this school, instruction was given in "turning, pasting, glass-cutting, finishing and other activities." (1—35) Thus began the non-classical secondary school curriculum in Germany.

27. Rousseau and his New System of Education. It is not at all strange that the author of *The Social Contract*, which has been blamed for the French Revolution, should also have written *Emile* which was the cause of an upheaval in educational thinking. Moreover, it is not strange that this same

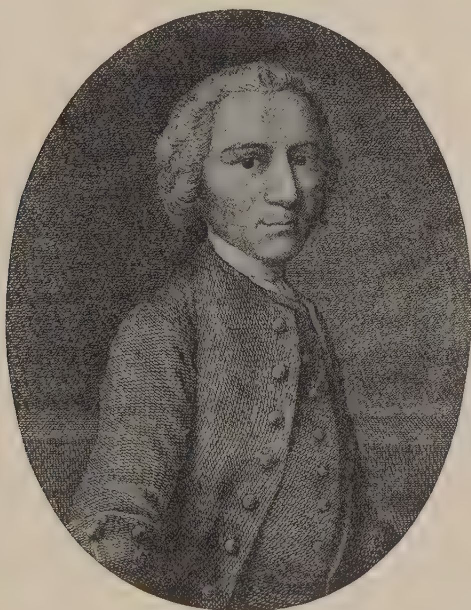

FIG. 13. JEAN JACQUES ROUSSEAU

book, which caused its author to flee from France to avoid arrest, should have been just the kind of force that was necessary to break down the walls of educational formalism and make way for the on-coming advocates of a pedagogy that recognized the nature of the child as the center of pedagogical inquiry. All this resulted from the publication of *Emile* by Jean Jacques Rousseau (1712–1778) in the year 1762. (Fig. 13)

Rousseau was born in Geneva, Switzerland. His father, who was of French origin, was a watch repairer and teacher of dancing. His mother, the daughter of a clergyman, died when Jean was born, and the indulgent aunt who took care of him during his early years failed to correct his many faults. As a

boy he was visionary and restless, and fond of nature and of works of fiction. During the years when he most needed a wise father and a protecting home influence he was wandering about, making the wrong kind of companionships, breaking contracts with any employer that displeased him, and living a more or less unwholesome life according to circumstances. During this period "he was successively an engraver's apprentice, a lackey, a musician, a student in a seminary, a clerk, a private tutor, and a music copyist." He is said to have changed his religion repeatedly, even for pecuniary inducements. He lived thus from hand to mouth until he was thirty-eight years of age.

"His first real awakening to his latent talents dates from the summer of 1749, when he undertook to compete for a prize offered by the Academy of Dijon for the best dissertation on the subject 'Whether the progress of the sciences and of letters has tended to corrupt or to elevate morals.' So eloquent was he in his paradoxical condemnation of civilization that he achieved at once a brilliant success." (12—671) During the next few years while living near Paris he wrote several books and then *Emile* which aroused such opposition in church and state that it became necessary for him to leave France. He went to Switzerland and to England but was allowed to return to France in 1767.

From many viewpoints Rousseau's life was full of contradictions. But in his wanderings he found out how people lived and what they thought. From experience he learned much about Nature, human nature, and social conditions. This experience furnished an especially vivid background for his writings. And this is just as true of his *Emile* as of his attacks on the social order of his time.

We know that Rousseau was acquainted with the writings of John Locke, for he says in his preface to *Emile*: "My subject was unexhausted and even new after Mr. Locke's treatise was written; and I am not a little apprehensive it will be so still, after mine." (13—Vol. I, p. xiii) He then goes on to point out that there is too little knowledge of infancy on the part of teachers.

They are always expecting the man in the child, without reflecting what he is before he can be a man. It is to this branch of education I have applied myself; so that, should my practical schemes be found useless and chimerical, my reflections will always turn to account. I may possibly have taken a very bad view of what ought to be done, but I conceive I have taken a good one of the subject to be wrought upon. (13—Vol. I, p. xiv)

Rousseau thought of his treatise as "nothing more than the progressive system of nature." Education should be natural and spontaneous. In setting forth his point of view in the first chapter he says:

We are born weak, we have need of help; we are born destitute of everything, we stand in need of assistance; we are born stupid, we have need of understanding. All that we are not possessed of at our birth, and which we require when grown up, is bestowed on us by education.

This education we receive from nature, from men, or from circumstances. The constitutional exertion of our organs and faculties is the education of nature; the uses we are taught to make of that exertion, constitute the education given us by men; and in the acquisitions made by our own experience, on the objects that surround us, consists our education from circumstances. (13—I, 4)

Thus, Rousseau says, we are formed "by three kinds of masters."

From this it is seen that the child of Rousseau's imagination, his Emile, would have very little to do with books for a long time—nothing until he had real use for them. The way was therefore open in his system, and especially in his "education from circumstances" for a large amount of education through nature study and the manual arts. The essence of his method in nature study seems to be expressed in the following:

Direct the attention of your pupil to the phenomena of nature, and you will soon awaken his curiosity; but to keep that curiosity alive, you must be in no haste to satisfy it. Put questions to him adapted to his capacity, and leave him to resolve them. Let him take nothing on trust from his preceptor, but on his own comprehension and conviction; he should not learn, but invent, the sciences. If ever you substitute authority in the place of argument, he will reason no longer; he will be ever afterwards bandied like a shuttlecock between the opinions of others. (13—II, 11)

Rousseau believed profoundly that experience is the best teacher and he would therefore have everything possible taught by actions, and say only what we cannot do. In a

delightful dialogue he reveals how he would go to the extreme of taking Emile to walk before breakfast in order to have him lost in the forest and so tired and hungry and thirsty by noon that he would cry. Then he would lead Emile to determine the points of the compass from the sun by observing the direction of his own shadow. Emile would reason which way to go to get out of the forest. Rousseau was sure that Emile would never forget the lesson learned through this day's experience.

Concerning the value of handwork he says that Emile "will learn more by one hour of manual labor, than he will retain from a whole day's verbal instructions." (13—II, 64) In another place he says: "I hate books; they only teach people to talk about what they don't understand." (13—II, 58) He would have Emile taught the simple manual arts. He considered labor a duty for both poor and rich. "Of the various occupations which serve to furnish subsistence to mankind those which approach nearest to a state of nature are the manual arts." Agriculture Rousseau considered the "most respectable of all arts and professions." Next to this came smithing and then carpentry. He would have Emile learn a trade, "a mechanical art, in the exercise of which the hands are more employed than the head; an art by which you will never get a fortune but may be enabled to live without one." (13—II, 95) (Source Material III, A.) His purpose in having Emile learn a trade was not that he would be likely to earn his living by it but because it would be a vital part of the process of his education.

> If instead of making a child stick to his books I employ him in a workshop, his hands labor to the profit of his mind, he becomes a philosopher but fancies he is only a workman.[1]

> It is necessary that he work like a peasant and think like a philosopher, lest he become as idle as a savage. The great secret of education is, to make the exercises of the body and the mind serve a relaxation to each other. (13—II, 115)

[1]Au lieu de coller un enfant sur des livres, si je l'occupe dans un atelier, ses mains travaillent au profit de son esprit: il devient philosophe et croit n'être qu'un ouvrier.—Rousseau, *Oeuvres Complètes*, Tome III, p. 348, Dalibon, Libraire, Paris, 1824.

These statements concerning the value of the manual arts in education place Rousseau ahead of his predecessors and many of those who came after him. *His recognition of the fact that the manual arts may be a means of mental training marked the beginning of a new era in education.* It prepared the way for the educational methods of Pestalozzi and those who followed in his train. However, his was the vision of a seer, the voice of a prophet; he did not put his theory into practice.

Rousseau would have Emile make his own choice of a trade or of several trades. This would be a safe procedure because previous to this time he would have acquired "a natural contempt for things that are useless; he would not be willing to throw away his time" in an unprofitable employment. He would choose a trade, that might have been of use to Robinson Crusoe on his desert island. (13—II, 101) Moreover, at the time of choosing the trade Emile "hath already served half his apprenticeship in the exercises to which he has been accustomed. He is ready to turn his hand to whatever you may require of him; he knows how to handle the spade and the hoe, to make use of the mallet, the plane, and the file; the tools of all workmen are familiar to him. All he needs further is to acquire the same dexterity." All things considered, Rousseau would prefer to have Emile learn the trade of the joiner because it is "neat and useful and may be carried on within doors; it is sufficiently laborious to keep the body in exercise, and requires both diligence and dexterity; at the same time taste and elegance are not excluded from being displayed on the form and contrivance of the work." (13—II, 110)

As to the method of acquiring the trade, Rousseau would have Emile go to a joiner once or twice a week and spend the whole day in his shop. He would have him rise early enough in the morning to be at the shop before the joiner arrived. He would have him eat at the joiner's table, work according to his orders—in fact, be an apprentice during the days he was with the joiner. Rousseau thought that by this method of learning Emile might learn several trades at once. (13—II, 111)

Again it becomes clear that Rousseau would have Emile learn a trade not so much for its practical use as for its value as

a means in acquiring what he considered the right kind of education. It is also clear that he was not thinking of shop-work taught to a class in the schoolroom, but of a boy getting some of the knowledge and skill Rousseau himself obtained when he was apprenticed first to a master craftsman in one trade and then in another, but to get it under the most favorable conditions of which he could conceive.

28. **Basedow and his Efforts to Apply the Principles of Rousseau.** Both temperamentally and chronologically Johann Bernhard Basedow (1723–1790) was the successor to Rousseau in the field of educational reform. Basedow was the son of a Hamburg wig maker. "His early youth was gloomy and unhappy, owing to the excessive severity of his father and the habitual melancholy of his mother." (6—73) His father wanted to make a wig maker out of him but Johann protested by running away from home and entering the service of a country physician. The physician discovered that the boy had unusual abilities and sent him home with a letter which resulted in his being sent to the Hamburg grammar school. Later some friends helped him to go to the University of Leipsic to take a theological course.

In the atmosphere of the University, with his natural independence, he soon became so unorthodox that he was not ordained, and in 1749 he began work as a private tutor. Four years later he obtained a professorship in ethics and fine arts at Soröe, in Denmark, where he remained for eight years, but his unorthodox religious writings while he was there caused him much trouble. Under these circumstances it was natural for him to find solace and inspiration in Rousseau's *Emile* and easy for him to turn to elementary education as his special field of future effort. He therefore began to write on education, and in this field his writings became popular. From 1768 to 1774 he produced several books, the most important of which were his *Methodenbuch* published in 1770 and his *Elementarwerk*, complete in four volumes, in 1774. The *Elementarwerk* contained one hundred plates of illustrations. These illustrations were intended to help in giving the students a knowledge of the world and things. He believed with Rousseau that the

best way to get knowledge was through the senses and through experience. But when the thing needed in such instruction was not available he would resort to models and drawings. (14—279) In this respect Basedow was following the lead of Comenius in his *Orbis Pictus* (cf. 17). Basedow's plan involved the vivid presentation to students either by objects or pictures: (1) Man—pictures of foreigners and wild men. (2) Animals—only such as are useful to know about; articles of commerce made from animals. (3) Trees and plants—only the most important ones; farmer's and gardener's implements. (4) Minerals and chemical substances. (5) Mathematical instruments for weighing and measuring; air-pump, siphon and the like; also maps and globes to explain the form and motion of the earth. (6) Trades—"the use of the various tools is to be taught." (7) History—illustrated by engravings of historical events. (8) Commerce—samples of commodities. (9) "The younger children should be shown pictures of familiar objects about the house and its surroundings." (14—280)

It will be seen from this that Basedow was trying to bring into the lives of a whole class or group of children what Rousseau would give to one child in the world of practical experience. It was therefore necessary for Basedow to bring the manual arts instruction into the school—make it a part of the school curriculum, whether done in the schoolroom or in special shops, or on the school land.

It may be doubted whether Basedow comprehended the fundamental value of handwork as a means of mental training as fully as did Rousseau. Whether he did or not it is clear from his *Methodenbuch* that he would use manual work as a prod in the hope of stimulating more effective book work. He says:

> It is necessary always to have in view for young people a dual sort of industry—manual work and the study of sciences. Bring it about that the culture of the mind shall cost them less trouble than the work of the hands, and lay down principles so elementary that you will succeed in your object as if unintentionally and by means of instructive play. Nevertheless, in regard to time, it is well to prescribe, as a rule, for students that they give certain hours to one of the kinds of occupation: say, ordinarily, six hours to one and two to the other. It is never necessary to fix more time than that for

study; nevertheless, if a child shows too little application, I would not wish him to be punished for that, but that he be told in a friendly tone: "My friend, you must apply yourself to mechanical pursuits since you show so little taste for those of the mind."

As for this manual work, one can, according to circumstances render it more severe and disagreeable, and, in consequence, constrain him, by rules and restrictions, to ask insistently that he be again admitted to the work of study. Nevertheless, if the aversion for study is such that the remedy in question is without effect, one always does better to occupy a young man with mechanical labors than with assiduous reading. The Republic of Letters can well do without him, and those who dispense the offices of State may well avoid giving him a place where much intelligence and erudition are necessary. When one is born in such a condition he will do well to be content with a little knowledge. Besides, I am sure that a mind which does not seem to be made for intellectual application will derive more profit from brief instruction at intervals than from extended and prolonged study which will not fail to repel and bore him. (15—65)

In the same year that Basedow published his *Elementarwerk*, 1774, Prince Leopold of Dessau helped him found an educational institution at Dessau in which the principles of the *Elementarwerk* were to be put into practice. The prince gave a building, a garden, and $12,000. The institution was called the Philanthropinum. Many men of prominence were interested in it. But Basedow proved to be totally unfitted to direct such an institution and the management was turned over to one of his assistants. After four years he left the school and it was soon abandoned.

Although the Philanthropinum experiment was a failure as a school, it had a very stimulating effect on educational discussion, and through the assistants of Basedow, it was the center of several reforms.

29. **Other Early Efforts to Apply the Principles of Rousseau.** Joachim Heinrich Campe (1746–1818), who was in charge of the Philanthropinum for a short time beginning in 1776, remained only a few months on account of unpleasant relations with Basedow. He then went to Trittow, near Hamburg, where he founded a similar institution. He has been spoken of as the best representative of the principles of the Philanthropinum. "He avoided the eccentricities of Basedow and thus gained for the principles which they both represented, a much larger number of friends." (6—116) Concerning manual work Campe said:

I, for my part, cannot deny that every child, be the standing or sex what it may, ought to be kept regularly, and from an early age, at some mechanical and corporeal work; provided only that in the choice of it regard be paid on the one hand to the future lot, and on the other to sex, and that one child must be more and another less occupied in this manner. The usefulness of this is indeed too great and manifold for me to wish any child to be deprived of it. (8—134)

Christian Gotthilf Salzmann (1741–1811) was the preacher at the Philanthropinum and conducted the devotional exercises and gave religious instruction there for three years. In 1784 he purchased a villa at Schnepfenthal, near Gotha, and founded a new school for the sons of people belonging to the higher classes of society. His school was very highly regarded. Following the ideas of Rousseau and Basedow, he placed emphasis on physical training and on manual work, but he was saner and more practical. Pupils were given instruction in paper work, carpentry, basket-making and turning by *specially trained teachers* in each subject, not by mere artisans. (8—132)

In addition to these Salzmann placed carpentry benches and tools in the rooms where pupils came together in their free hours so as to tempt them to work. It was found that the boys often preferred work at the bench to any other way of spending their time. But such work was merely incidental. He said, "I am of the opinion, however, that it is requisite to a good education that the child should perform some manual task in real earnest." (8—133) Salzmann believed that all institutions claiming to give children an adequate education should make it an indispensable condition that pupils be trained to readiness in play of various kinds and later in the use of tools. And he maintained that all teachers should be able to do work with their hands. He especially recommended that they learn work in wood and paper. He recommended these because they are cleanly and because they require the use of so many different kinds of tools—knife, plane, chisel, drill, hammer, screwdriver, etc. "When thou knowest how to handle such tools, then thy strength and efficiency are greatly increased." (8—134)

The superintendent of the manual work in Salzmann's school was Bernhard Heinrich Blasche (1766–1832), a man of much experience as a teacher and a writer on handwork in edu-

cation. Like Rousseau, he advocated that the manual arts "be taught as a basis for intellectual improvement." (16—73) His most important book, *Die Werkstätte der Kinder*, was published in four parts in 1800–1802. This was "a complete summary of such kinds of work as were at that time considered suitable for pedagogic purposes." (17—62) In 1805 his book on *The Art of Working in Pasteboard* was published, which went through four editions in the next six years. This gave the geometric principles underlying the art, and full information concerning the choice of tools and materials, and directions for working. Later he added a small volume containing a course of models. (18—III)

In Switzerland, Martin Planta (1727–1772), a clergyman and educator, opened a school at Haldenstein in which he aimed, "first, to give a Christian education and, secondly, to prepare pupils for the various careers—political, administrative, military and commercial." In this school he placed emphasis upon "physical exercise, including gymnastics and excursions. The pupils were encouraged to make collections of minerals, plants and insects." (19—IV, 722) Much attention was given to manual work of different kinds with an educational end in view. Among the kinds of work done by the children were pasteboard work, wood-turning, glass-cutting, gardening, and similar occupations. "Barometers, thermometers, and various physical and mathematical instruments were made." (16—56) In many respects Planta seems to have been the natural predecessor of Pestalozzi.

30. **Schools of Industry.** While the efforts to adapt the principles of Rousseau's teaching to school conditions were taking place in Central Europe, economic conditions, Christian zeal, and the experiences of Francke led to the development of a new type of school in Austria, Germany, and England.

During the time when Ferdinand Kindermann (1740–1801) was serving as a parish priest in Kaplitz he determined to make school reform his life work. The schools under his charge soon became famous, and in 1775 he was appointed superintendent of schools for Bohemia, and made professor of pedagogy in a *Gymnasium* in Prague. Later he was knighted and

also made a bishop of the church for the great service he had rendered to Bohemian schools. (6—504)

The special service rendered by Kindermann was in his introduction of remunerative industrial work into the *Volkschule.* It is said that he had noticed that when peasants were trained in the normal school they did not want to cultivate the ground any more or do any hard work. This suggested to him the idea of putting industrial work into the *Volkschule.* He knew the poverty of the teachers and he knew, also, the poverty of the parents who were obliged to pay tuition for their children. He thought, therefore, that by bringing into the schools industrial work for which pupils would receive pay he could help both parents and teachers. The motive of Kindermann was, therefore, economic rather than pedagogic.

Kindermann was acquainted with Francke's institution at Halle, but he considered it too expensive, and that it reached too few people. "If one wishes to put industry and love of work in place of the begging and laziness of a whole people, the means he employs must be as general as the evil." Therefore, instead of following Francke's model of an industrial school for poor children, he put industry into the schools of the poor. He began to organize such work in the schools as early as 1774, and in 1787 there were more than one hundred schools of this new type in Bohemia, including nineteen in the city of Prague. (20—101)

Among the different kinds of industrial work done in these schools were flax and wool spinning, knitting, and sewing for girls and braiding, wood joinery, furniture making, and woodcarving for boys. In rural schools instruction was given in the cultivation of gardens and fruit trees and the culture of silkworms and bees. (20—102) The hours for industrial work were separate from the hours for the school studies. There was little or no vital connection between the industrial work and the other school work. The purpose of the industrial work was, primarily, to give the children an opportunity to earn money while attending school. Pupils sometimes made enough through the industrial work to pay for their education. (20—103)

In spirit and purpose, then, the "school of industry" or the industrialized *Volkschule* of Kindermann belongs to the pre-Rousseau period—the period of Francke and his school for beggar children. While his scheme did not get very much public support, his wisdom, energy, and ability to work with all classes of people won for him high honors. The industrial work he introduced disappeared from the schools after a few years but the statement has been made that if one had asked the successful Bohemian farmers, or the thriving merchants, or the wealthy manufacturers of the early part of the nineteenth century the cause of their material prosperity they would have answered, "It was the school which gave us the love and desire for work and showed us the blessing of industry, order and economy." (16—58)

In North Germany the first to put into practice the "school of industry" idea was Ludwig Gerhard Wagemann, a clergyman, who started such a school in Göttingen in 1784. Similar schools sprang up in all parts of Germany. They were opened in Lippe-Detmold in 1788, Würzburg in 1789, Hanover in 1790, Würtemburg in 1795, Prussia in 1798, Gotha in 1798, Baden in 1803, and Hessen in 1808. (8—135) Like the schools under Kindermann these schools were intended principally for children of the poorer classes. Their first object was to accustom the children to industry and activity and to prevent idleness. A secondary object was to enable the school children to earn money by the work of their hands. (17—63) Hence these schools looked more to the financial results than to the formal education of the children. "They were more industrial and economical than educational." (8—135)

These "schools of industry" had from the very first "great difficulties to contend with, the most important of which were the want of proper teachers, lack of necessary funds, and popular prejudice. No wonder, therefore, that the greater part of them perished in the disturbances of war." (17—63)

In England there was a corresponding development of "schools of industry." In 1791 such a school was founded at New Forest in Hampshire; in 1796 one was established at Lewisham in Kent and there are records of others at Kendal,

Birmingham, Cheltenham, Chester, and elsewhere. The one at Kendal may be taken as typical. In this school one hour a day was given to reading and writing; the remainder of the day was given to industry. "The master was a youth of eighteen who was paid half a guinea per week. He was assisted by a boy of fourteen who acted as usher and received eighteen pence per week for his services." According to Sir Thomas Bernard (1750–1818) in the report of the Society for Bettering the Condition of the Poor these two, with the assistance of the upper and more intelligent boys, supplied all the instruction where 112 children were "educated and fitted for a useful life." (21—XX, 79)

In the Lewisham school reading only was taught; in some other schools arithmetic was added to reading and writing, but only the merest rudiments were attempted. The inculcation of religion was an important motive in the establishment of such schools and so the reading was confined to the New Testament. (21—XX, 78)

The industrial work, when the schools were in rural districts, consisted of "weeding, picking stones, etc., whilst in the towns various occupations were taken up, such as shoe-making, pin-pricking, straw-plaiting, etc." (21—XX, 79) At the Kendal school the children were taught shoe-making, and it is stated that some of the boys after eighteen months' instruction were able to make shoes completely with the exception of finishing them with the knife, the last and most difficult operation of all. Some of them were even able to do this. At the Birmingham school, the committee built a workshop in which boys were employed by a master pin-maker to head the pins and to stick them in rows in paper.

"The industrial occupations of the girls were carried on with vigor, and embraced many household duties, such as sewing, knitting, laundry work, baking, etc. Spinning was a favorite occupation, as was also straw-plaiting for both boys and girls." (21—XX, 79)

In the Lewisham school the hours "extended from 6 A. M. to 6 P. M. in the summer and during daylight hours in the winter. The children received two meals per day, breakfast

and dinner, at the school. These meals constituted a first charge upon their labor and 1 s. 6 d. per week per head was deducted from their earnings in payment." (21—XX, 80) At the end of a month a boy might have as much as 5 s. to his credit.

In order to understand the results of these schools one must remember that the children, for the most part, could not have gone to school at all had it not been for this device of earning while going to school. Also it should be recalled that there was no popular demand for education among the poor people of England at that time. On the contrary, those who advocated schooling had to combat the apathy of a great majority of their fellow-countrymen. (21—XX, 80)

In France, at this time, the people were in revolution against the government and although the Schools of Industry Movement was looked upon with favor, its plan was not put into practice. In 1793 Robespierre laid before the National Assembly a plan for public education which had been drawn up by Michael le Peletier who was murdered a few months previous. The following is an extract from his plan:

> Public education, besides giving strength and health, must instil the duty of the habit of work, because this is to all both a necessity and an advantage. I do not refer to a thorough knowledge of any particular kind of work, but rather to that energy, that activity, that industriousness and that perseverance to the end which characterizes the life of every diligent individual. Educate such men, and the Republic will see its fruits of agriculture and of industry redoubled. Instil in the child this need, this habit of work, and his future existence is secured, as he will then be entirely dependent upon himself. I consider this part of education as the most important, and therefore my plan of general instruction contains manual labor as its vital feature. Of all the sources which are apt to stimulate the average child, none will produce a greater desire for activity than physical work.
>
> By this bill which I lay before you, I hope to interest fathers, teachers, and pupils. Fathers, because their taxes will be decreased; teachers, because they may hope for honor and recompense in this new field; and children, because the accomplishment of some real, material work will always be to them a source of great delight. I would desire that various kinds of handicraft work might be introduced. (16—65)

31. **Industrial Instruction in America.** Meanwhile the idea of schools for teaching industrial occupations along with the usual academic subjects of the time was taking root in the United

States of America. In 1745 a group of Moravian Brethren came to Pennsylvania and established a colony at Bethlehem on the Lehigh River about 50 miles north of Philadelphia. In religious beliefs and form of worship the Moravians were followers of John Huss, and they sought refuge in Pennsylvania that they might be free to worship as they desired. In this colony property was held in common and the labor of each was for the common good. A description of the colony written in 1778 says that all the unmarried men lived together in a large stone building and all the unmarried women lived in another similar building. The children remained with their parents until about twelve years of age and were sent to a public school where they were taught "reading, writing, arithmetic, the learned languages and other parts of literature, according to their abilities, and the business they are designed for. Here likewise they were instructed in the elements of religion." (22—XXXIV, 122) At twelve the boys were sent to live at the house of the single men where their lives were regulated by strict discipline. They ate, slept, worked, and worshipped together. The elder single men were nearly all artisans and worked at their trades, and the boys of twelve years and upward were instructed in the particular trades or arts they were intended to pursue. All were under the inspection of overseers appointed by the Society; all were "regular in their hours of labor, refreshment and rest." Idleness was banished; all were industrious and active. Behind the house was a large and well laid-out garden which, no doubt, the boys helped in cultivating—especially those boys who were to become gardeners. (22—XXXIV, 123)

No specific statement concerning the particular "trades or arts" taught to the boys is available at this writing but the fact that the buildings were of stone would indicate that stone-masonry along with carpentry was practiced in the community and the following statement reveals something of the variety of industries early established in Bethlehem:

Under the hill, on the little rivulet Monakisy, at the distance of about thirty rods from the main street, the tradesmen are planted, who can use the stream in promoting their particular business. Here is a grist-mill, fulling-

mill, saw-mill, a dyer's shop with fine copper boilers set in mason-work, a tan-house and yard, a bark-house, a mill for stamping bark, another for pounding and softening leather, an oil-mill, a mill for manufacturing oat-meal, split peas and the like, a skinner's mill (that is, to manufacture deer's leather) and a mill to break and soften hemp, to fit it for spinning. (22—XXXIV, 124)

In a similar way all the single women lived together in a large house presided over by a matron. Under her direction the single women were "employed and instructed in spinning of all kinds, knitting, weaving, needlework, embroidery, tambour, and other female arts." The same economy of time and the same industry were observed here as in the house of the single men. Music was included for some, at least, for in the chapel were "a spinnet, bass-viol, and other musical instruments," which were played upon at morning and evening prayers. (22—XXXIV, 123)

For eight years, beginning in December 1787, a type of gardening and carpentry work was done at Cokesbury College in Maryland which seems to have been the prototype of the work done under the impulse of the Manual Labor Movement which began in America about forty years later. This college was located at Abingdon, twenty-five miles from Baltimore, and was the first to be established by the Methodists in America. The site of the college included six acres of land which was enclosed by a fence. A portion of this enclosure was used for a garden. "A person skilled in gardening was appointed to overlook the students in their recreations, where each was at liberty to indulge his own peculiar taste from a tulip to a cabbage. There was also a place for working in wood (*taberna liguaria*, as they called it) with all proper instruments and materials, and a skillful person was appointed to direct the students at this recreation." (23—232) In explanation of this work the prospectus sent out in 1785 states:

We prohibit play in the strongest terms. . . . The employments, therefore, which we have chosen for the recreation of the students are such as are of greatest public utility—agriculture and architecture. (23—233)

Dr. Benjamin Rush (1745–1813), celebrated physician of Philadelphia, and one of the signers of the Declaration of Independence, wrote a letter in 1790 on "The Amusements and

Punishments proper in Schools," in which he commended the Methodists of Abingdon for "introducing the care of vegetable gardens as an amusement." He pointed out with apparent satisfaction that the amusements of the Moravian children at Bethlehem, Pa., were "derived from their performing the subordinate parts of several of the mechanical arts," and he adds, "a considerable portion of the wealth of that worthy and happy society is the product of the labor of their little hands." (24—427)

Dr. Rush gave further facts concerning the garden work at Abingdon when he said in another letter, "A large lot is divided between the scholars, and premiums are adjudged to those of them who produce the most vegetables from their grounds, or who keep them in the best order." (25—12) Then, turning aside from the work at Abingdon and giving his own ideas, he said:

> As the employments of agriculture cannot afford amusement at all seasons of the year, or in cities, I would propose that children should be allured to seek amusements in such of the mechanical arts as are suited to their strength and capacities. Where is the boy who does not delight in the use of a hammer, a chisel, or a saw? And who has not enjoyed a high degree of pleasure in his youth in constructing a miniature house? How amusing are the machines which are employed in the manufacturing of clothing of all kinds! And how full of various entertainment are the mixtures which take place in the chemical arts! Each of these might be contrived upon such a scale, as not only to amuse young people, but to afford a profit to their parents and masters. (25—12)

Three years previous to the writing of the above letter by Dr. Rush there appeared in the *Columbian Magazine* (April 1787), a Philadelphia publication, an anonymous article on a "plan for establishing schools in a new country where the inhabitants are thinly settled and whose children are to be educated with special reference to a country life." This article set forth in considerable detail a scheme for educating young people to become superior farmers and farmers' wives. The scheme was to employ the children so much of the time and in such an effective way that their labor would pay for their board and for a superior type of schooling. By so doing the greatest obstacle to getting an education would be removed (cf. 30). Each school, or rural academy, as it was called, under

this scheme would have a large tract of land consisting of "meadow, tillage and woodland." On this would be erected a building, in which the students would live, also a barn, a workshop, and a school. These would all be adequately equipped with furniture, stock, and tools. A skillful farm manager, two assistants—one a farmer and the other a gardener—a schoolmaster, a schoolmistress—who was to be the housekeeper—and a cook were to be employed. The boys were to be taught fruit growing, brewing, managing cattle and bees, etc. In the winter they would "make the woodwork of all those utensils of husbandry which will be requisite for the ensuing season." The girls were to be taught "to sew, to knit, to spin, to cook, to make beds, to clean house, to make and mend their cloaths, to make the boys' cloaths when cut out, and to mend them—to milk cows, and to make butter and cheese." Among the academic subjects mentioned as desirable were geography, history English literature, bookkeeping, geometry, surveying and mechanics. The "principles of religion and morality" would be emphasized. (26—I, 356 to 359) (Source Material III, B)

The particular importance of this article, aside from its general influence upon the educational thought of the time, was due to the fact that, ten years later, in 1797, Dr. John de la Howe of Abbeville, South Carolina, left a will which provided for the endowment of "an agricultural or farm school in conformity, as near as can be . . . to a plan proposed in the *Columbian Magazine* for the month of April 1787," for educating, "lodging, feeding and uniformly clothing twelve poor boys and twelve poor girls whose parents or who themselfs have resided in Abbeville County . . . not less than six years." (27—2) Orphans were to be given preference.

Dr. de la Howe was a French physician who had settled among the Huguenots of South Carolina in the latter part of the eighteenth century. He purchased several tracts of land until, when he died, he left an estate of 2,630 acres. He had named the place Lethe, for when there he wanted to forget some of his earlier experiences in France. His will provided that 500 acres should be "laid out for the farm" and that "one

thousand acres shall forever remain in wood or forest in order to supply the farm with convenient range and with fuel and timber, and in process of time contribute to the support of the institution." (27—5) "These thousand acres remain today a great domain, wherein are . . . many original pines, a tree becoming more and more rare." (28—1)

The boys were to be "instructed in reading, writing, arithmetic, principles of geography and geometry so far as to render them versed in practical surveying, and the girls in reading, writing and four common rules of arithmetic." Both boys and girls were to be instructed "in such Chymical principles . . . of malting, brewing, distilling, baking, fixing different colors, making vinegar, soap, cheese, butter, etc." (27—4) "The general, plain and practical parts of religion and morality" were to be taught, "without meddling with speculative and controverted points." (27—4)

"For 128 years the property left by de la Howe was indifferently administered, at times the will being fully carried out and at others the estate being used merely in a business way." In 1917, however, in accordance with a contingency provision in de la Howe's will, the state of South Carolina assumed the management of the property, erected a new building, added funds for maintenance, and broadened the scope of the school so as to care for the indigent children of the entire state. Now it is known as the De la Howe State School. (28—1) It is probably the oldest agricultural school in the United States.

SOURCE MATERIAL III, A

Rousseau's Estimate of the Value of the Manual Arts in Education

From *Emilius and Sophia* by J. J. Rousseau

I will not here enquire whether it be true, that industry is more exerted in the elegant arts, than in those which give the first form to the massive substance and fit it for common uses: But I affirm that in all cases, those arts which are the most general and indispensible are incontestibly those which deserve to be held in the greatest esteem; and that such as require the least assistance from others, deserve still less to be degraded lowest of all, when they are at the same time the most free and independent. These rules form the true criterion whereby to judge of the merit, and estimate the value, of arts and industry. All other are arbitrary and capricious. The first and most respectable of all arts and professions is that of agriculture: Next to the husbandman I rank the smith; to the smith succeeds the carpenter, and so on. A child, who should not have acquired a misjudging partiality from vulgar prejudices, would rank them also precisely in the same order. How many important reflections on this subject, may not Emilius deduce from Robinson Crusoe! What will he think in seeing the arts carried to perfection, by being divided and subdivided into such a number of branches, and by the invention of such an infinite variety of implements to work with? Will he not call their ingenuity ridiculous, and think they are afraid their arms and fingers are not fit for use, that they have contrived so many expedients to work without them? To exercise one trade, they must be furnished with tools by a thousand others: The artisans of a whole town must be employed to set any one of them to work. As to my companion and myself, our ingenuity lies in our dexterity; we make use of the tools we carry about us. Let the proudest workman belonging to the nicknackitories of Paris come to our desert island, his talents useless here, he will be glad in his turn to serve an apprenticeship to us.

Confine not your observation here, reader, to the corporeal exercise, and manual dexterity of my pupil; but consider the proper methods we take to gratify his childish curiosity; remark the effects of his good sense, his genius for invention, his foresight and other intellectual abilities. In whatever he sees, or is employed in, he wants to know the reason of every thing; tracing back one instrument from another, till he arrive at the first and most simple. He takes nothing upon supposition or on trust; but refuses even to learn any thing that requires a previous knowledge of which he is not possessed. If he sees, for instance, a file, or a spring, he immediately recurs to the method of working up the materials from the ore. If he sees the sides of a chest fitted together, he must know the methods of felling the timber and sawing it into planks. If he be, himself, at work, he never fails to reflect on every new tool he makes use of, and to consider how he might have constructed such an implement, or have made shift without it.

There is an error, however, difficult to avoid, in employing your pupil in these mechanical operations; and that is, you will always suppose him to have a taste for those you are fond of yourself: but you must beware, that, while you are seeking your own amusement, you do not fatigue and disgust

your pupil, who perhaps will not let you perceive it. Your little artisan should find in himself every thing needful to execute his designs, but he should find in you every thing needful to direct him in those designs. You should observe him, and watch his motions continually, without his knowing it; you should anticipate his thoughts, and prevent those which are improper; in short, you should keep him so employed, that he should not only be sensible of the use of his own talents, but that he should take delight in his employment, from a like sense of its utility. (13—II, 70–73)

But in a state of society, where he must be necessarily maintained at the expence of the community, he certainly owes the state so much labour as will pay for his subsistence; and this without exception to rank or persons. To labour, then, is the indispensible duty of social or political man. Rich or poor, strong or weak, every idle citizen is a knave.

Now of all the occupations, which serve to furnish subsistence to mankind, those which approach nearest to a state of nature are the manual arts: of all conditions of life, the most independent of fortune or the caprices of mankind, is that of the artisan. The artisan depends only on his own labor; he is as free as the husbandman is a slave; for the latter depends on the produce of his fields, which lies at the discretion of others. The enemy, the sovereign, a powerful neighbour, a law-suit, may run away with the crop, which he hath laboriously toiled for: He may be distressed a thousand ways by means of the local stability of his property; whereas, if an artisan be oppressed in one place, his baggage is easily packed up, he folds his arms about him, and disdainfully marches off to another. Agriculture is, nevertheless, the principal profession of mankind; it is the most honest, the most useful, and of course the most creditable in the world. I have no need to bid Emilius apply himself to agriculture: It is already his study: Every kind of rustic employment is familiar to him. His first application was to the labours of the husbandman, and it is in those he regularly exercises himself. I say to him, therefore, cultivate the land thou inheritest from thy fathers. But it may be said, suppose this were to be lost, or that a child had no paternal inheritance, what must he do then? Learn a trade.

My child learn a trade! make my son a mechanic! consider, sir, what you advise—I do, madam, I consider this matter better than you, who would reduce your child to the necessity of being a lord, a marquis, or a prince, or perhaps one day or other to be less than nothing. I am desirous of investing him with a title that cannot be taken from him, that will in all times and places command respect; and, I can tell you, whatever you may think of it, he will have fewer equals in this rank than in that he may derive from you.

The letter destroys and the spirit maketh alive. I would not have him learn a trade, merely for the sake of knowing how to exercise it, but that he may overcome the prejudices usually conceived against it. You will never be reduced, you say, to work for your bread. So much the worse for you; I say, so much the worse. But, no matter; if you labour not through necessity, do it for reputation. Stoop to the situation of an artisan that you may raise yourself above your own. To make fortune subservient to your will, you must begin by rendering yourself independent. To triumph in the opinion of the world, you must begin by despising that opinion.

Remember, I do not advise you to acquire a talent, but a trade; a mechanical art, in the exercise of which the hands are more employed than the head; an art by which you will never get a fortune, but may be enabled to live without one. (13—II, 93–95)

I am determined, therefore, that Emilius shall learn a trade. A creditable one, to be sure! you will say. I should like to know the meaning of that word. Is not every employment creditable that is useful? I would not have him learn to be an embroiderer, a gilder or varnisher, like the fine gentleman of Mr. Locke. I would have him neither a fidler, a player, nor a pamphleteer. Except these professions, and a few of a similar nature, he might take his choice of all others; I would confine him to nothing. I had much rather he should be a cobbler than a poet; that he should learn to pave the highway, than enamel or paint the flowers on china. But, you will say, spies, bailiffs' followers, and even hangmen are useful people in their way. That they are so, is the fault of government, which might render them useless: But to give up this point; I was indeed mistaken, it is not enough to fix on a trade useful to society; it should be such a one as doth not require those who exercise it to be possessed of those detestable qualities of mind, which are incompatible with humanity. We will recur, therefore, to the term you made use of, and chuse a creditable employment, always remembering, however, that nothing should be called creditable that is not at the same time useful. (13—II, 99, 100)

By these views, should we be conducted in choosing a trade for Emilius; or rather, we ought to have that choice entirely to him; as, the maxims he hath already imbibed, giving him a natural comtempt for things that are useless, he will never think of throwing away his time in an unprofitable employment; and he judges of their being profitable by their real utility: he would chuse a trade that might have been of use to Robinson Crusoe in his desart island.

By giving a child a successive view of the various productions of nature and art, by exciting his curiosity and tracing its tendency, we may be enabled to study his taste, inclinations and propensities; to discover the first spark of his genius, if he have one of any particular turn. But it is a common error, which you ought carefully to avoid, that of attributing our own inclination and convenience, in choosing among professions of the same rank? The manufacture of hard-ware is useful, perhaps the most useful of all others; and yet, without some particular reason for it, I should not make your son a brazier or a blacksmith; I should not like to see him, at the forge, resemble the figure of a Cyclops. Neither would I make him a mason or bricklayer, and still much less a shoe-maker. Somebody doubtless must be of those trades; but he who can make choice of which he pleases, ought to have some regard to cleanliness and neatness: these do not depend on caprice, but affect our senses. Add to this, I should not like any of those stupid professions, in the exercise of which the workmen need neither industry nor ingenuity; but like mere machines, employ their hands constantly in the same manner. Such are cloth and stocking weavers, stone-sawyers, and the like. To what

purpose should a man of any understanding be put to such trades; wherein the workman and his engine, are only one machine moving another?

All things duly considered, the trade I should like best my pupil should have a taste for, is that of a joiner. This is neat, useful, and may be carried on within doors: it is sufficiently laborious to keep the body in exercise, and requires both diligence and dexterity: at the same time, taste and elegance are not excluded from being displayed on the form and contrivance of the work.

If it should so happen, indeed, that your pupil has a natural turn for the speculative sciences, I should not blame you for teaching him a mechanic art conformable to his inclinations; let him learn, for example, to design and construct mathematical instruments, quadrants, telescopes and the like. (13—II, 108–110)

Unfortunately we cannot spend all our time at the work-bench; as we not only apprentice ourselves to the profession of a joiner but to that of man; the latter of which is by much the most tedious and difficult to learn. What then shall we do? Shall we hire a master-joiner, for an hour in a day, as we do the dancing-master? No. That would not be making ourselves his apprentices, but his scholars; and our ambition is not so much to learn the trade, as to raise ourselves to the condition of a joiner. I am therefore of opinion that we should go once or twice a week, at least, and spend the whole day at his shop; that we should rise at his hour in the morning, that we should be at our work before him, that we should eat at his table, work according to his orders, and, after having had the honour of supping with his family, return, if we pleased, to sleep on our own hard mattrasses. Thus you see how we might learn several trades at once, and exercise ourselves with manual labour, without neglecting our other accomplishments. (13—II, 111)

If I have hitherto made myself understood, the reader will perceive that, while I have accustomed my pupil to corporeal exercise and manual labour, I have given him insensibly a taste for reflection and meditation; in order to counterballance that to the warmth of genius the mere effect of opportunity, and to construe into an inclination for a particular art, that spirit of imitation which is as common to the ape as to the human species, and leads him mechanically to do what he sees done by others, without very well knowing to what purpose. The world is full of artisans, and particularly of artists, who have no natural talents for the arts they profess, to which they have been trained from their infancy, either from motives of convenience, or from some apparent zeal which had operated as well in favour of any other art, had the same opportunities offered of seeing it exercised. One youth hears the beat of a drum, and conceives himself born to be a general; another sees the masons at work, and immediately forms the design of being an architect. Every one is tempted to make choice of that profession which offers itself, and appears to be held in esteem. (13—II, 101, 102)

But, perhaps we here make the choice of our employment of too great consequence. As it relates only to some handicraft business, Emilius need not hesitate, he hath already served half his apprenticeship in the exercises to which he has been accustomed. He is ready to turn his hand to whatever

you may require of him: he knows how to handle the spade and the hoe, to make use of the mallet, the plane, and the file; the tools of all kinds of workmen are familiar to him. All that he needs farther is to acquire the same dexterity and facility, in the use of them, as a good artist in that peculiar branch to which he may apply. To this end, also, he hath a great advantage above most other children; in the agility of his body and the suppleness of his limbs, by means of which he can throw himself into any attitude, and continue any kind of exercise for a long time without tiring. Add to this that his senses are acute and experienced; and all the mechanism of the arts already known to him. To turn the work out of his hands like a master, he requires nothing but practice; and practice is to be gained only by time. All that we have to do therefore, is to determine what kind of mechanic employment we shall bestow so much time on, as to make ourselves expert in the exercise of it. (13—II, 104, 105)

I would have a young man learn to exert a strong arm; to handle the axe and the saw; to square a piece of unhewn timber, to mount the roof of a house, to lay on the ridge, and to fit the joists and scantlings. (13—II, 108)

Thus far however is certain, that if any man whatever be ashamed of being seen to handle a plane, or wear a leather apron in public, he is only a slave to prejudice, one that would be ashamed of the most commendable actions, if they were ridiculed as unfashionable. We may give up nevertheless to the prepossessions of parents, whatever be not injurious to the understanding of the child. It is not necessary to exercise indiscriminately such professions as are useful, merely to do honour to them all; it is sufficient not to hold any one in less esteem than it deserves. When we are at liberty to make our choice, and have no other motives to determine us, why may we not consult indolence which would be the natural result of his indifference for the opinions of mankind and the tranquility of his passions. It is necessary that he work like a peasant and think like a philosopher, lest he become as idle as a savage. The great secret of education is, to make the exercises of the body and the mind serve as a relaxation to each other. (13—II, 114, 115)

SOURCE MATERIAL III, B

A "Rural Academy"

Plan for establishing Schools in a new country, where the inhabitants are thinly settled, and whose children are to be educated with a special reference to a country life.

From the *Columbian Magazine*, Vol. I, 1787.

Take any number of settlers, we will suppose sixty families, collected in a village, and they will be able to support a schoolmaster, and easily maintain their children at school: for twenty shillings a year, paid by each family, will make up a competent salary for the master, and the children will be cloathed and fed at home.

But if these sixty families are dispersed over a large tract of country, from twenty to forty miles in extent, how shall their children receive the benefits of education? The master's salary, it is true, can be paid as in the former case; but few parents will be disposed to incur the heavy expence of sending their children from home, and boarding them at a distant school. Hence, in such a scattered settlement, general ignorance will ensue; and the people consequently degenerate into vice, irreligion and barbarism. . . . To remedy evils of such magnitude will be difficult; perhaps it will be thought impracticable: to attempt it, however, will be laudable; and all those who have the dearest interests of society at heart, will give the measure their support.

If by charitable donations, or by grants of the state, adequate funds could be formed, to defray the expences of the board and tuition of such children, the evils before mentioned would be remedied: but such funds are not to be hoped for: and if they could be obtained, it might well be doubted whether that would be the best mode of educating children destined for a laborious country life. There the boys are to be the future farmers, and the girls the farmers' wives. If both could, in early life, be well instructed in the various branches of their future employments, they would make better husbands, better wives, and more useful citizens. And if the mode of communicating such instruction could at the same time enable them largely to contribute to their own support, another important advantage would be gained. . . . These reflections have given rise to the following:

PLAN OF EDUCATION FOR A COUNTRY LIFE

1. Let three or four hundred acres of land be appropriated for the use of a school: let it consist of meadow, tillage and wood-land, in convenient proportions.

2. Let a skilful and industrious manager be provided, who shall himself be a complete farmer, and have two labourers, one acquainted with farming, the other with gardening, to assist him.

3. Let the farm be completely stocked, and all the requisite carriages and husbandry utensils provided: such tools as are designed for boys, to be made of sizes suited to their strength.

4. Let the necessary buildings be erected for a school, a boarding house, a barn and work-shop. These may be very plain and cheap, and at the same time very comfortable. The necessary furniture and tools must also be provided.

5. A schoolmaster and schoolmistress must be chosen with much circumspection. The latter will be the housekeeper.

6. A cook will be necessary; and she should know how to dress the plain, wholesome food of the country, in the best manner.

7. The children's beds and bedding, cloaths and materials for cloathing, must be provided by their parents.

The necessary foundations being thus laid, the school and farm may be conducted agreeably to the following regulations:

1. No boy or girl under eight years of age should be admitted.

2. Both boys and girls should be taught to read, write and cypher. The boys should also be instructed in every useful branch of husbandry and

gardening, and the girls in every kind of work necessary for farmers' wives to know and practise.

3. For the purpose of working, let the boys be divided into such a number of classes as shall be judged convenient, distributing equal proportions of the larger and smaller boys to each class. Whenever the nature of the work to be done will admit of it; let equal portions of it be assigned to the several classes, in order to excite their emulation, to excel in industry and skill: and for this reason each portion of land should be cultivated, through a whole season, by the same class to which it was first allotted. . . . It will be obvious to direct the several boys in the same class, to perform such parts of the general labours required of it, as shall be adapted to their several capacities and strength.

4. All the boys may be taught the methods of making and rearing nurseries of the most useful kind of fruit trees, shrubs and bushes, and of improving the former by grafting and budding. Each boy should have an equal portion of land allotted to him, on which he should raise a nursery; and when he has finished his course of education, should be allowed to take home with him all the trees, shrubs and bushes he has reared and cultivated; excepting only such a portion as shall be requisite for supplying the school-farm. In like manner he should be allowed to take home with him a collection of useful garden seeds. In this way the most valuable fruits and plants would in a few years be spread and cultivated through the whole settlement.

5. When orchards shall be grown, they may be instructed in the art of making and fermenting cyder, so as to produce a soft and pleasant liquor.

6. A small brewery may be erected on the farm, and all the boys taught to malt barley and oats; and both boys and girls may be taught the art of brewing, so far, at least, as the same might be practised in every farmer's family. Perhaps by extending the plan of the malthouse and brewery, they might be able to supply that wholesome and nourishing liquor, good beer, to a great part of the settlement; and thus the use of pernicious, distilled liquors be superseded. Malt, at least, might thus be furnished, and yield a small revenue towards supporting the school.

7. The management of cattle will make a necessary branch of their education; and the modern method of managing bees will well deserve their attention.

8. Tending the cattle, and providing fuel and fencing stuff, will be the principal employments of the winter. But the boys may also make the woodwork of all those utensils of husbandry which will be requisite for the ensuing season. The elder boys will be capable of handling axes, and all the other tools used in those employments.

9. The girls will be taught to sew, to knit, to spin, to cook, to make beds, to clean house, to make and mend their own cloaths, to make the boys cloaths when cut out, and to mend them—to milk cows, and to make butter and cheese.

10. That they may learn to cook and perform all other household work, they should be divided into classes, in the same manner in which the boys were classed, and assist the housekeeper and cook, a week at a time, in rotation.

11. A collection of children, from eight to fourteen or fifteen years of age, thus regularly employed, on a good farm, would be nearly able to maintain themselves; and if the expences of their schooling can thus be reduced as low, or nearly as low, as when, in ordinary cases, they live at home, the great obstacle to their education will be removed.

12. The winter will be the season most favourable for the literary instruction of the children; as then they will have but few necessary avocations: perhaps no more than will occasion that degree of exercise which the preservation of their health may require. But their learning need not be wholly interrupted in summer. Every morning the boys may spend two hours at school and be ready to go in the field to work by eight or nine o'clock. And when they go out, the girls may enter, and also spend two hours at school. Again at one o'clock (if they dine at noon) the boys may attend the school, continuing there an hour and an half, or two hours; and the girls may succeed them, as in the forenoon, attending the school a like length of time. Thus the same master might every day teach both girls and boys; and yet, in the whole, not to be confined above seven or eight hours in a day. . . . An hour every evening might be allowed the children, to amuse themselves in innocent sports.

13. The employments of a country life are so congenial to the human heart, the master of this rural academy could hardly forbear to engage in them, in the intervals between school hours. He would naturally be led to read the best authors on agriculture and rural affairs, and to get some acquaintance with botany. He would study theories, tracing useful practices back to their principles; and thus be able to communicate to the elder boys, or youths, a degree of scientific knowledge of the very important art of which, in the field, they daily learned the practice.

14. I hardly need mention, what ought to be an indispensable part of education in every literary institution. That the children at this rural academy would be taught the plainest and most important principles of religion and morality.

15. It is to be presumed that the abler farmers would continue their children at school till they should be fourteen or fifteen years old. These children of both sexes, might make further advances in learning. They might study geography, and read some instructive histories, particularly the history of the United States, and a few of the best English moral writers, in prose and verse. At the same time they might learn so much of bookkeeping as would be useful in the country; and the boys might be taught geometry, practical surveying, and the principles of mechanics.

16. Perhaps some useful manufactories might be established, in which the children, both male and female, might be very serviceable.

Such an institution as that here sketched out, need not be confined to frontier settlements; though the first idea of it was suggested by a reflection on their situation. Rural schools, or academies, upon such a plan, would perhaps be the most useful that could be established in the country towns and counties of this and every other state in America. Numerous advantages would result from them. I will hint at a few.

1. The children would be taught the plainest and most useful principles and rules of religion and morality.

2. They would be well and uniformly educated in the most necessary learning and in the most important arts of civil life, *husbandry* and *domestic economy*.

3. They would acquire habits of industry.

4. Their manners and behaviour would be formed, and rendered mild and agreeable.

5. A few successive sets of scholars thus educated, returning to their several homes, would quite change the face of the country, in point of cultivation, and introduce a pleasing change in the knowledge, manners of the people, and abolish the invidious distinction of citizens and clowns. (26—I, 356–359)

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CHAPTER IV

Handwork a Fundamental Means in Education

32. **Pestalozzi and his Preparation for his Life Work.** The student of the history of the manual arts in education is likely to go through some such experience as this: First, he will learn that Pestalozzi has been called the "father of manual train-

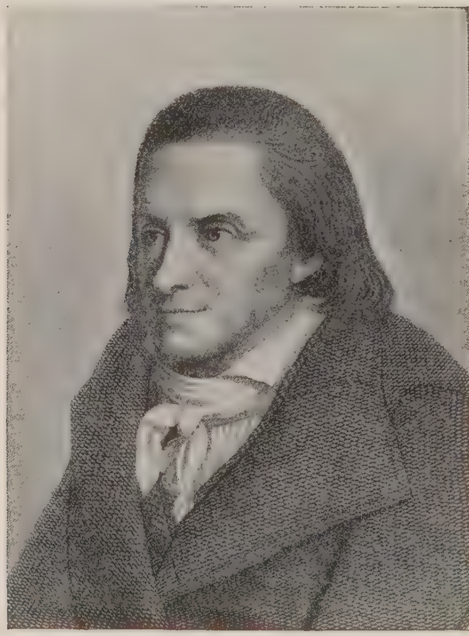


Fig. 14. John Henry Pestalozzi. From Barnard: *Life Educational Principles and Methods of John Henry Pestalozzi*

ing," and not finding much about the earlier development of handwork instruction in the usual textbooks on the history of education, he will think of Pestalozzi as the man who first organized handwork as a part of general school work and who probably enunciated certain principles of handwork instruction

in a rather definite and organized form. Secondly, on further study, he is surprised to learn how little Pestalozzi really accomplished in this field, how his work never did become organized very much and how he did not seem to do as much as several of his predecessors and contemporaries. Thirdly, after more extended study, however, he begins to catch the full value of the motives behind the work of Pestalozzi, of the significance of the spirit in which he worked, and of the fundamental importance of some of his rather loosely stated principles. He sees what grew out of Pestalozzi's work for education and then he begins to understand the true place of the great reformer in the development of all manual and industrial education. He sees that to call Pestalozzi the "father of manual training" is only a fraction of the truth and that such a phrase alone does not convey the big idea for which the name of Pestalozzi stands.

Johann Heinrich Pestalozzi (1746–1827), Fig. 14, was the son of a Zurich physician of modest means who died when Heinrich was only six years old. He, with a brother and a sister, were brought up by a pious and self-denying mother and a faithful servant who had promised the father on his death bed to remain with the family. (1—290) His early life, therefore, was passed "in an atmosphere of love, devotion, and peace, of rigid economy and of noble generosity." (2—4) In school he was looked upon as incompetent; he was poor in spelling and in writing and he had a poor verbal memory. He once said of himself in comparison with his schoolmates, "Although I worked hard, and learned some things well, I had none of their ability for the ordinary lessons, and so I could not take it amiss that they dubbed me Harry Oddity of Foolsborough." (2—6) In spite of this, however, he gained their good will by his unselfishness.

From the time that he was nine years old Pestalozzi spent a few weeks each summer with his grandfather, Andrew Pestalozzi, who was the pastor of a village about three miles from Zurich. It was in this village among the hills "that Pestalozzi, the schoolboy, passed his happy holidays; here that he learned to love nature and the work of the fields; and here that he

first conceived the noble idea to which he was destined to devote his whole life. Already the peasants of this canton had begun to combine industry with agriculture. As yet there were neither factories nor machinery, it is true, but in every family there was a certain amount of spinning done by hand.

"By accompanying his grandfather on his daily visits to the schools, the sick and the poor of his parish, the child was initiated into the realities of the life of the people; and although this was his first acquaintance with their sufferings, he was touched with profound compassion for them, and from that moment there burned in his heart an unquenchable desire to find some remedy for the evil." (2—7)

It was but natural therefore that when the time came for him to choose a profession he selected the ministry. He entered the University of Zurich with meagre preparation, so far as the prevailing scholarship standards of the time were concerned, but he was so inspired by the professors and the high character of their instruction that he soon became a distinguished scholar. At the end of his theological course, however, when he attempted to preach, he found that his thoughts had been going in another direction to such an extent that he gave up the ministry and began to study law, but this also was soon given up. (2—11)

Meanwhile Rousseau's *Emile* and *The Social Contract* had created a great stir in the large towns like Geneva and Zurich. Following the action of Paris, the Geneva magistrates denounced Rousseau's writings. The people, who felt that they had been robbed of their ancient rights, requested that this act be repealed, but their petition was disregarded. The patriotic students at the University of Zurich were in sympathy with the people of Geneva and were deeply interested in the writings of Rousseau. They undertook "a crusade against the abuses and injustices of the time." Pestalozzi was one of the men who were impressed by the writings of Rousseau, and, as an enthusiastic member of the Helvetian Society formed in 1765, he became one of the chief contributors to the weekly local paper published by that society. The discussion of politics in the paper was forbidden, but there were many other subjects of human welfare upon which Pestalozzi was

now eager to express an opinion. (2—13) His later activities in this liberal-minded group of students caused him to be looked upon as "a dangerous revolutionary." All chance of appointment to public office was now gone, so that he was obliged to look in another direction for opportunity to help the poor whom he desired to serve.

"The real cause of the material poverty of the people, he reasoned, is their intellectual and moral degradation. . . . But as only those can be really helped who are in a position to help themselves, the first step towards an improvement in the condition of the people will be to see that they are properly educated." (2—18)

When Pestalozzi gave up the study of law he turned to agriculture. At that time there was a strong sentiment among many men of learning that Switzerland would be better off if more intelligent citizens would settle on small holdings and live in the country. Besides, Rousseau had declared that agriculture was "the best and happiest of all occupations." Pestalozzi shared these opinions and hoped, moreover, that "by setting an example of an improved method to the Swiss peasants, he would enable them not only to live in comfort, but provide for their children that intellectual and moral training which is so necessary for the citizens of a republic." (2—21)

He therefore spent a year, beginning in the summer of 1767, with an expert agriculturist at Kirchberg, near Berne. He took part in all the farm work and was very happy. Here he worked out his own plans for growing madder and vegetables. (2—27) In the fall of 1768 he returned to Zurich in search of suitable land for his new enterprise. For twenty-three pounds he purchased about fifteen acres near the village of Birr. This was later increased to about one hundred acres.

Meanwhile Pestalozzi had become engaged to an excellent young woman of fine family and unusual education in Zurich, Anna Schultress. He had known her from boyhood, but had become intimately acquainted in recent years through a mutual friend, "a young man of remarkable intelligence and high character," and especially through their common grief at his

death. Her family did not look with favor upon Pestalozzi. At that time his health had been overtaxed by work and study; he was careless of his personal appearance, awkward in everything he did, absent-minded, visionary, and impractical. He did not fit well into her home of culture and refinement, yet

FIG. 15. PESTALOZZI'S HOME AT NEUHOF. FROM KRÜSI: *Pestalozzi: His Life, Work and Influence*

she recognized the nobility of his character, and they were betrothed in 1767, just before Pestalozzi went to Kirchberg to learn agriculture, and they were married in 1769. (2—31) In a few months they had begun their new life as farmers, and in a few months more a son was born to them whom they named Jacobli. The cultivation of the farm and the education of his son during the next few years provided the foundation of experience upon which was erected his philosophy of education.

33. **The Neuhof Industrial School Experiment.** Pestalozzi's plans called for farm buildings in the Italian style. (Fig. 15) These were near enough to completion in the spring of 1771

so that the family moved into the house. They called the place Neuhof. But Pestalozzi did not prosper in his farming. As was feared by some of his friends, his lack of practical business experience and his philanthropic motives worked against his financial success. Then, too, the land he purchased did not prove to be as fertile as he expected, and the workmen he employed were inefficient. He failed in his efforts to grow madder and in attempts to establish a cheese dairy. But in spite of these failures and the fact that he was heavily in debt, and with buildings incomplete and various land improvements only begun, Pestalozzi determined, at all costs, to begin to satisfy the great desire of his life by trying to lessen the misery and suffering and sin of the world through the education of the children of the poor. His "thoughtful experiments with his son had suggested new ideas and new principles of education which seemed to him to be particularly fitted for the regeneration of poor children." The child's need for continual activity suggested utilizing that activity in useful work. If children were guarded against fatigue he thought "it would be possible not only to teach children to earn their bread but to cultivate their intellectual and moral nature at the same time. He thought, too, that a country life, in which the cultivation of the land was combined with some sort of handicraft would provide the best means for teaching the poorest children." (2—52) This was the only way he saw of relieving the distress of the poor people, and he longed to demonstrate just how it could be done effectively. Then, too, his unfortunate experiences with the available farm laborers had encouraged him in the hope of something better from children, especially if brought up under his own roof. (2—53)

He therefore began to put his theory to a test in the winter of 1774 when he brought into his own home about twenty poor children, some from the neighboring villages and "some who were vagrants from the roadside." He "clothed them, fed them, and treated them in every way as his own. They were always with him, sharing in the work of the garden, in the fields, and the house, and in bad weather spinning cotton in a large out-house. Very little time was given to actual lessons;

indeed the children were often taught while working with their hands, Pestalozzi being in no hurry to teach them to read and write, convinced as he was that these are useful only for those who have learned to talk well. He gave them constant practice in conversation, however, on subjects taken from their everyday life, and made them repeat passages from the Bible till they knew them by heart." (2—54)

From the educational viewpoint this experiment was a complete success. In a few months the poor children had undergone a remarkable change. They had become cheerful and frank; they enjoyed their work as well as their lessons. But from the financial standpoint the experiment was not a success; it was found that the work done by the children was by no means sufficient to properly cultivate the land.

"This experiment at Neuhof had been talked of far and wide, and had excited the interest and admiration of all such men as were capable of appreciating the beautiful and noble thought that had suggested it. Money was offered to Pestalozzi with which to carry it on, and he was advised to appeal to the friends of humanity for help to extend his undertaking and so make it a complete success." (2—54) This he did in 1776. In this appeal he said in reference to handwork:

> I have for a long time thought it probable that, under favorable circumstances, young children might be able to earn their own living without undue labor, provided that enough capital were advanced to organize an establishment, in which they would not only live, but at the same time receive a certain elementary education. I consider that any careful experiment in this direction would be of the highest importance to humanity. . . .
>
> I have proved that it is not regular work that stops the development of so many poor children, but the turmoil and irregularity of their lives, the privations they endure, the excesses they indulge in when the opportunity offers, the wild rebellious passions so seldom restrained, and the hopelessness to which they are so often a prey.
>
> I have proved that children, after having lost health, strength, and courage in a life of idleness and mendicity, have, when once set to regular work, quickly recovered their health and spirits, and grown rapidly. Such is the effect of altered circumstances, and the absence of disquieting influences. (2—55)
>
> I promise that if I succeed in getting this help, I will abandon every other occupation, and devote my whole time and strength to the education of poor friendless children. I promise that the number of the children shall be regulated by the financial support I receive. I promise to teach them all

to read, write, and cipher; I promise to give all the boys, so far as my position and knowledge will allow me, practical instruction in the most profitable methods of cultivating small plots of land, to teach them to lay down pasture land, to understand the use and value of manures, to know the different sorts of grasses, and the importance of mixing them; the nature and use of marl; the effect, still disputed, of the repeated application of lime; the management of fruit trees, and perhaps of a few forest trees. All this will come naturally out of the work connected with the actual needs of the house, and will not be a special study calling for increased expense. It will be the household needs, too, that will give the girls an opportunity of learning gardening, domestic duties, and needlework.

The chief occupation in bad weather will be cotton spinning.

I undertake to furnish all these children with suitable food, clothing, and lodging, and have already made many of the necessary alterations and arrangements in my house.

I promise to give the most conscientious attention to their religious instruction, and to do all I can to put gentleness and purity into their hearts. (2—57)

In 1778 Pestalozzi made a report to the Berne Agricultural Society which includes a statement about each of the 37 children then in his school. Concerning the ability of the children one finds such statements as these: "He seems to have a good disposition; he is intelligent, strong and useful in the fields; he is attentive, a good weaver, and is beginning to write fairly well." "He is a healthy boy, strong, and accustomed to working in the fields; the best weaver in the house; is beginning to write a little, and likes French. He is quick in everything, but ill-mannered and uncouth." "Admitted three years ago in a state of utter ignorance, but very intelligent. Now she spins, reads, and writes fairly well, likes singing, is principally engaged in the kitchen." (2—63)

In his report Pestalozzi speaks of getting very valuable help in the management of the establishment and the care of the children from a Miss Spindler of Strasburg "who is both highly gifted and of untiring activity." Then he adds, "I have, besides, a master to teach weaving, and two skilled weavers; a mistress to teach spinning, and two good spinners; a man who winds for the weavers and teaches reading at the same time; and two men and two women who are almost always employed on the land." (2—66)

About this time Pestalozzi increased the number of his children "hoping in this way to improve the financial condition of

his undertaking," but in this he was disappointed. His problems were only multiplied. In 1780, after five years of experiment and struggle Pestalozzi was obliged to abandon the enterprise. Before he was aware of it he was so deeply in debt that it took not only his own but the greater part of his wife's property to satisfy creditors. He was able to retain only the house and an acre or two of the land. (2—67) Among the reasons for this failure were the following:

(1) He had no legal agreement with parents, and sometimes they would take their children away as soon as they were well clothed. (3—57) (2—67)

(2) He attempted to carry out his experiment on too large a scale and involving too much technical knowledge and skill, especially in spinning and weaving. (3—58)

(3) He did not select his children with reasonable protection for the success of the institution. Some were so deficient mentally or physically that there was no possibility of their earning their living.

(4) He was unable to prevent the spread of contagious diseases in his household.

(5) He was not a successful organizer and business man.

(6) He was trying to solve what is regarded as an unsolvable problem—to enable the average child to earn a good living and the tuition for a high type of education by the labor of his own hands during the years when he is receiving instruction.

Although Pestalozzi was keenly aware of the fact that his five years of experiment at Neuhof had brought him economic failure, he was not ready to admit that the principles upon which he endeavored to work were wrong. On the contrary, he said that he was "never more profoundly convinced of the fundamental truths" on which he had based his undertaking than when he saw that he had failed. (2—74)

In this frame of mind Pestalozzi sought to make his ideas public by writing. In 1780 he wrote the *Evening Hour of a Hermit,* a collection of short paragraphs bearing on human nature and education. But these aphorisms were not generally understood. Then, in an effort to write in a more popular

style, he hit upon the idea of picturing the peasants as he knew them. He wrote the story *Leonard and Gertrude* which appeared in 1781. This was a success from the start, but Pestalozzi gained very little financially from this fact because he had sold the manuscript for less than a shilling a page. The next year he published a second book, but it was a disappointment. Then followed years of struggle with poverty, during which he wrote on political subjects as well as education.

34. **Pestalozzi Finds Another Opportunity to Help Poor Children.** When the French invaded Switzerland in 1798 Pestalozzi became a zealous supporter of the new order of things because he thought he saw in it the possibility of bringing about the reforms he had advocated. After the battle of Stanz, Pestalozzi was asked to take charge of a home for the children whose parents had been killed in the combat. The new part of an Ursuline convent, also certain out-buildings and a portion of the adjoining land were designated for the use of the orphanage. Pestalozzi went to Stanz in December 1798 and received 50 children in January, even before the buildings were ready, and soon the number was increased to about 80. (Fig. 16) The work was begun under the most unfavorable physical difficulties and was brought to a sudden end after five months when the French soldiers needed the building for a hospital. Yet during these few months with the children at Stanz, with only one helper, a woman servant, Pestalozzi put into practice many of his ideas and laid the foundation for methods of teaching which he developed later. In writing to a friend concerning his experiences at Stanz he said:

> I had observed for a long time that behind their coarseness, shyness, and apparent incapacity are hidden the finest faculties, the most precious powers; and now, even amongst these poor creatures by whom I was surrounded at Stanz, marked natural abilities soon began to show themselves. I knew how useful the common needs of life are in teaching men the relations of things, in bringing out their natural intelligence, in forming their judgment, and in arousing faculties which, buried, as they were, beneath the coarser elements of their nature, cannot become active and useful till they are set free. It was my object then to arouse these faculties, and bring them to bear on the pure and simple circumstances of domestic life, for I was convinced that in this way I should be able to form the hearts and minds of children almost as I wished. (3—15)

I tried to connect study with manual labor, the school with the workshop, and make one thing of them. But I was the less able to do this as staff, material, and tools were all wanting. A short time only before the close of the establishment a few children had begun to spin; and I saw clearly that, before any fusion could be effected, the two parts must be firmly established separately—study, that is, on the one hand, and labor on the other.

But in the work of the children I was already inclined to care less for the immediate gain than for the physical training which, by developing their strength and skill, was bound to supply them later with a means of livelihood. In the same way I considered that what is generally called the instruction of children should be merely an exercise of the faculties, and I felt it important to exercise the attention, observation, and memory first, so as to strengthen these faculties before calling into play the art of judging and reasoning: this, in my opinion, was the best way to avoid turning out that sort of superficial and presumptuous talker, whose false judgments are often more fatal to the happiness and progress of humanity than the ignorance of simple people of good sense. (2—167) And I am more than ever convinced that as soon as we have educational establishments combined with workshops, and conducted on a truly psychological basis, a generation will necessarily be formed which, on the one hand, will show us by experience that our present studies do not require one-tenth part of the time or trouble we now give to them. (2—169)

In July 1799 Pestalozzi was given an opportunity to teach in a primary school in the little town of Burgdorf in the canton of Berne. In a few months he had won the approval of the School Commission of the town and was given an opportunity to teach the next class higher. In this school Pestalozzi is said to have centered all his teaching on the elements—language, form, and number. Meanwhile a young man, Hermann Krusi (1775–1844), was helping to conduct a school for poor children at the castle of Burgdorf. After a few months of acquaintance Pestalozzi suggested that they work together, and in July 1800 Pestalozzi was granted the gratuitous use of such part of the castle as he might need for his school, also a portion of the garden belonging to the castle. This brought together in the same building the poor refugees and the children of the well-to-do families of Burgdorf. With the able assistance of Krusi and three others who joined the staff from time to time the school grew in numbers and in reputation so that many persons of prominence visited the school and reported favorably upon its methods. In 1804, however, a change of government required the use of the castle for the

Fig. 16. Pestalozzi at Stauz. From *How Gertrude Teaches Her Children*, by Pestalozzi
Copyright, C. W. Bardeen, 1898

prefect of the district and Pestalozzi's school was, therefore, transferred to a chateau at Münchenbuchsee about three miles from Berne and quite near to Hofwyl, the estate purchased a few years previously by a wealthy friend of Pestalozzi, Emanuel von Fellenberg, for the purpose of establishing there an educational and philanthropic institution. Fellenberg proposed that they work together. He would take the financial control of the institution, leaving Pestalozzi free to devote his entire effort to educational matters. At first Pestalozzi accepted, but in a very short time he dissolved the partnership and accepted the offer of the old castle at Yverdun on Lake Neufchatel where, after more struggles with poverty, he and his devoted assistants established the institute that became famous. To this new center of pedagogical influence came teachers from many countries, some being sent by their governments. Children came great distances to be taught by the new method. Kings, noblemen, and other men of wealth contributed money to promote its work. This popularity, however, lasted only a few years, before, owing to mismanagement and internal difficulties, the institute began to decline. It closed in 1824.

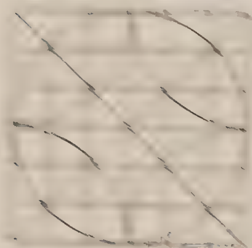
35. **Pestalozzian Methods.** From what has been said already it should be clear that Pestalozzi's great contributions to pedagogy grew rather naturally out of (a) his intense desire to improve the condition of the poor in Switzerland, especially the children, (b) his firm belief that such improvement, to be permanent, must come through education, (c) his stated opinion that the schools should be in closest connection with and prepare for the life of the home instead of leading away from it, (d) his interest in Rousseau's doctrine of education according to nature, (e) his early conviction that under favorable conditions the manual labor of children could be utilized to pay for their education, and (f) his repeated successful use of objects and manual labor, both skilled and unskilled, as a means in teaching the traditional school subjects. His work therefore pointed toward education for all children, poor or rich, and toward education by new methods—the methods that have found fuller development under the influence of modern psychology.

"There are two ways of instructing," said Pestalozzi, "either we go from words to things or from things to words. Mine is the second method." (4—2, 325) He was in no hurry to have children read and write; first he wanted them to talk intelligently, count and perform simple mathematical processes, acquire power to observe accurately and learn a great many facts about the common things of life. "I wish always to let sense impression precede the word, and definite knowledge the judgment. . . . From his very first development I wish to lead my child into the whole circle of Nature surrounding him; I would organize his learning to talk by a collection of natural products; I would teach him early to abstract all physical generalizations from separate physical facts, and teach him to express them in words; and I would everywhere substitute physical generalizations for those metaphysical generalizations with which we begin the instruction of our race. Not till after the foundation of human knowledge (sense impressions of Nature) has been fairly laid and secure would I begin the dull, abstract work of studying from books." (4—326)

Following the practice of Comenius (cf. 17) and Basedow (cf. 28) Pestalozzi used woodcut illustrations in teaching the facts of nature, but later made more extended use of the natural objects themselves or "well-made models" of them. Dr. Mayo, an Englishman who spent some time at Yverdun and later established a Pestalozzian school at Cheam in Surrey, gives the following incident:

One day, the master having presented to his class the engraving of a ladder, a lively little boy exclaimed, "But there is a real ladder in the court-yard; why not talk about it rather than the picture?" "The engraving is here," said the master, "and it is more convenient to talk about what is before your eyes than to go into the court-yard to talk about the other." The boy's observation, thus ended, was for that time disregarded. Soon after, the engraving of a window formed the subject of examination. "But why," exclaimed the same little objector, "why talk of this picture of a window when there is a real window in the room, and there is no need to go into the court-yard for it?" Again the remark was silenced, but in the evening both circumstances were mentioned to Pestalozzi. "The boy is right," said he, "the reality is better than the counterfeit; put away the engravings, and let the class be instructed by means of real objects. (5—viii)

This decision to use real objects in teaching led to taking the children out into the fields and elsewhere, but as the sub-



square, as well as its rectilinear divisions. This has been done; and I think I have organized a series of such measuring forms, the use of which makes the learning of all measurements and the proportions of all forms easy to understand, just as the A B C of sounds makes the learning of language easy.

This A B C of form, however, is an equal division of the square into definite measure-forms, and requires an exact knowledge of its foundation—the straight line in a vertical or horizontal position.

These divisions of the square by straight lines produce certain forms for defining and measuring all angles, as well as the circle and all arcs. I call the whole the A B C of form.

This should be presented to the child in the following way:

We show him the properties of straight lines, unconnected and each by itself, under many conditions and in different arbitrary directions, and make him clearly conscious of the different appearances, without considering their further uses. Then we begin to name the straight lines as horizontal, vertical, and oblique; describing the oblique lines first as rising or falling, then as rising or falling to right or left. Then we name the different parallels as horizontal, vertical, and oblique parallel lines; then we name the principal angles formed by joining these lines, as right, acute, obtuse. In the same way we teach them to know and name the prototype of all measure-forms, the square, which rises from joining together two angles, and its divisions into halves, quarters, sixths, and so on; then the circle and its variations, in elongated forms, and their different parts.

All these definitions should be taught to the children as results of measuring with the eye, and the measuring-forms named in this course as square, horizontal or vertical oblong (or rectangle); the curved lines as circle, semicircle, quadrant; first oval, half-oval, quarter-oval, second, third, fourth, fifth, and so on. They must be led to use these forms as means of measuring, and to learn the nature of the proportions by which they are produced. (4—189–191)

As soon as the child draws readily and correctly the horizontal line with which the A B C of form begins, out of the whole chaos of objects seen and shown we try to find him figures whose outline is only the application of the familiar horizontal line, or at least offers only an imperceptible deviation from it.

Then we go to the vertical line, then to the right angle, and so on. As the child by easy application of these forms becomes stronger, we gradually vary the figures. The results of these measures (which agree with the natural physical mechanical laws) on the art of drawing are as remarkable as those of the A B C of form upon the art of measuring. While in this way the children before they proceed farther bring to perfection every drawing, even the first beginning drawing, a consciousness of the result of perfected power is already developed in them, in the first steps of this art; and with this consciousness are also developed an effort towards perfection and a perseverance towards completion, which the hurly-burly caused by the folly and disorder of our unpsychological men and methods of art education never attempts or can attempt.

The foundation of progress in children so taught is not only in the hand; it is founded on the intrinsic powers of human nature. (4—195, 196) (Source Material IV, A and IV, B.)

It was the belief of Pestalozzi that children taught by this method of "measuring-forms would gradually gain in power of expression through the drawing and reach the point where the further use of geometrical lines as guides would become superfluous and "nothing shall remain but the art itself."

Ability to draw was utilized in penmanship and in nature study. In teaching the land formations in geography he made use, also, of clay modeling. He would have the children observe the forms in nature and later model them in clay from memory.

Pestalozzi maintained that the same principle of analysis and the construction of an alphabet which he used in teaching form should be applied in the teaching of practical abilities. He wished to "psychologize instruction," or as has been said later, he wished to put subject-matter into pedagogic form. He said:

> In endeavoring to impart to the child those practical abilities which every man stands in need of, we ought to follow essentially the same progress, as in the communication of knowledge, beginning from an alphabet of abilities, if I may so express myself, that is to say, from the simplest practical exercises, which being combined with each other, would serve to develop in the child a general fund of ability, to be applied to whatever purpose circumstances might render it necessary in after-life. Such an alphabet, however, has not yet been found, and that for the obvious reason, that it has not been sought for. I am not inclined to think that it would be very difficult to discover it, especially if the research were made with the same zeal, with which even the most trivial abilities connected with the operation of money-getting are attended to. If once discovered, it would be of essential benefit to mankind. (6—82)

If Pestalozzi had applied his idea of an alphabet of abilities to the teaching of the manual arts he would, in all probability, have developed a system of tool instruction similar to that outlined in Russia in 1868, but it seems to be clear that he never reached the point of making one of his alphabets apply in the field of the manual arts beyond form study and drawing. His thought in reference to the "alphabet of abilities" led him much more in the direction of gymnastics than systematic instruction in the manual arts. Concerning the manual work at Yverdun, DeGuimps says:

> We know that manual labor had a place in Pestalozzi's scheme; it was often tried at the institute, but never kept up in a regular manner. The

great number and diversity both of the pupils and their occupations proved an insurmountable obstacle. Gardening met with most success. Sometimes the pupils had a little patch of their own to cultivate; sometimes they were told off in twos and threes to work for a few hours, under the direction of the gardener. They did fairly well at bookbinding and cardboard work; they also made solids for the study of geometry. (2—272)

SOURCE MATERIAL IV, A

The Pestalozzian Method of Teaching Drawing as Told by Johannes Buss

From *Life, Educational Principles and Methods of John Henry Pestalozzi*

At first I thought the children were detained too long at one point; but I was soon reconciled to this, when I saw the perfection which they attained in their first exercises, and the advantages which it insured to them in their future progress. I now perceived, for the first time, the disadvantages under which I myself had labored, in consequence of the incoherent and desultory manner in which I had been taught in my boyhood; and I began to think that, if I had been kept to the first elements with similar perseverance, I should have been able afterward to help myself, and thus to escape all the sufferings and melancholy which I had endured. (3—199, Part I)

I had learned an art, but I was ignorant of the basis on which it rested; and now that I was called on to apply it, in a manner consistent with its nature, I found myself utterly at a loss to know what that nature was. With all the attention and zeal I brought to the subject, I could not understand the peculiar view which Pestalozzi took of drawing, and I could not at all make out his meaning, when he told me that lines, angles, and curves were the basis of drawing. By way of explanation, he added, that in this, as in all other matters, the human mind must be led from indistinct intentions to clear ideas. But I had no idea, whatever, how this was to be done by drawing. He said it must be done by dividing the square and the curves, by distinguishing their simple elements, and comparing them with each other. (3—199 in Part I) . . . I did violence to myself and, abandoning my preconceived notions of the subject, I endeavored to view all things in the light of those same elements; till, at last, having reached the point of simplicity, I found it easy, in the course of a few days, to draw up my sketch of an alphabet of forms.

Whatever my eyes glanced upon from that moment, I saw between lines which determined its outline. Hitherto I had never separated the outline from the object, in my imagination; now I perceived the outline invariably as distinct from the object, as a measurable form, the slightest deviation from which I could easily ascertain.

But I now fell into another extreme. Before I had seen nothing but objects; now I saw nothing but outlines; and I imagined that children must be exercised on these lines exclusively, in every branch of drawing, before real objects were to be placed before them for imitation, or even for comparison. But Pestalozzi viewed his drawing-lessons in connection with the whole of his method, and with nature, who will not allow any branch of art to remain isolated in the human mind. His intention was, from the first beginning, to lay before the child two distinct series of figures, of which one should be contained in his book for the earliest infancy, and the other should furnish practical illustrations for a course of lessons on abstract forms. The first were intended to form, as it were, a supplement to nature, in giving children an intuitive knowledge of things and their names. The second was calculated

to combine the practical application of art with the theoretical knowledge of its laws, by connecting the perception of abstract forms with an intuitive examination of the objects that fitted into those forms. In this manner, he meant to bring nature and art to bear upon each other; so that, as soon as the children were able to draw a line, or a figure, real objects should be presented to them, so exactly corresponding as to render their imitation a mere repetition of the same exercise which they had before performed in the abstract.

I was afraid lest, by giving the child real objects, his perception of the outline should be disturbed; but Pestalozzi did not wish to cultivate any power against nature, and he said, concerning this subject: "Nature gives no lines, but only objects to the child; the lines must be given to the child, that he may view the objects correctly; but to take the objects from him, in order to make him see lines only, would be exceedingly wrong."

But there was another difficulty in which I had entangled myself. Pestalozzi told me that children must learn to read those outlines like so many words, by denominating the different parts, the lines, angles, and curves, with different letters, so that their combinations may be as easily expressed in language, and put down in writing, as any other word by the composition of its letters. In this manner an alphabet of forms was to be established and a technical language created, by means of which the nicest distinctions of the different forms might be clearly brought before the mind, and appropriately expressed in words calculated to illustrate them by the difference of the formation. (3—200, Part I)

SOURCE MATERIAL IV, B

Pestalozzi's Discussion of Measuring in Its Relation to Teaching Drawing

From *Life, Educational Principles and Methods of John Henry Pestalozzi*

The principle that practice and readiness in measuring should precede practice in drawing, or at least must keep pace with it, is as obvious as it is unused. But the process of our methods of education is, to begin with, incorrect seeing; to build awry, then to pull down, and so on ten times over, until after a long time the sense of relations becomes developed, and then at last we come to what we should have begun with—to measuring. Such is the proceeding of our methods, and yet we are so many thousands of years older than the Egyptians and Etruscans, whose drawings all depend upon a trained power of measuring, or in fact, were at bottom nothing more than measurings.

And now the question comes up. By what means is the child to be trained to this basis of all art, the right meaning of objects which come before his eyes? Evidently by a succession including the whole of all possible intuitions; and by an analysis of the square, according to simple certain and definite rules.

Young artists, in the absence of such elementary exercises, find the means, by long practice in their art, of acquiring greater or less facility in so placing any object before their eyes and imitating it as it is in nature. And it can not be denied that many of them, by painful and long-continued efforts,

have, from the most confused intuitions, attained to a sense of relations so far advanced that the measuring of objects is superfluous to them. But then each individual had a different system; none of them had any nomenclature, for none of them had any distinct conscious comprehension of the system; and, accordingly, they could not properly communicate it to their scholars. The latter were thus in the same condition in which their teachers had been, and were obliged to attain the same result—correct sense relations—with the extremest exertion and by long practice, and with their own means, or rather with no means at all. Thus art remained in the possession of a few fortunate individuals, who had time and leisure to travel by such an incommodious road to the requisite attainment. Art could not be considered as concerning all men, nor could instruction in it be demanded as a universal right, although it is such. At least, this can not be denied by any one who admits that it is the right of living men, in an enlightened state, to be able to learn reading and writing: for the tendencies to draw, and the capacity for measuring, develop naturally and freely in the child; while the painstaking efforts which must be made in order to bring him to spell and read, must be applied either with great skill or with harshness and violence, if they are not to injure him more than reading is worth to him. Any drawing, if it is to promote the aim of instruction, the attainment of intelligent ideas, is necessarily connected with the measuring of forms. The child before whom an object is placed to be drawn before he can represent to himself its proportions in their whole form, and express himself upon it, can never make the art, as it should be, an actual means of proceeding from obscure intuitions to intelligent ideas; nor procure from it the actual substantial advantage throughout his whole education and in harmony with the great purpose of it, which it ought to and can afford him.

In order to establish the art of drawing upon this basis, it must be subordinated to that of geometry; and the subdivisions into angles and curves which proceed from the rudimental form of the square, as well as the divisions of curves by straight lines, must be arranged into regularly classified geometrical forms. This has been done; and I believe that I have arranged a series of geometrical forms, whose use will as much facilitate the child's acquisition of geometry, and his acquaintance with the proportions of all forms, as does the alphabet of sounds his studies of language. (3—204, Part II)

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CHAPTER V

The Fellenberg Institution at Hofwyl

36. **Fellenberg's Theory of Society.** Just as Pestalozzi was the new and vital force in the realm of educational philosophy and method during the early part of the nineteenth century so Fellenberg, applying in some measure the principles enunciated by Pestalozzi, was the new force in practical school organization and administration during the same period. Dr. Henry Barnard said, in 1854, that the educational establishment at Hofwyl "attracted more attention, and exerted a wider influence than any one institution in Europe or America" during the half-century then closing. It was visited and studied by educators and statesmen, many of whom wrote reports which were published. It has been stated that more than one hundred such reports appeared in print. (1—351)

Because manual labor constituted the chief distinguishing characteristic of Fellenberg's scheme, and because it gave a great impulse to three types of institutions that followed it,—the agricultural school, the industrial reform school and the manual labor school, the founder of Hofwyl and his system of training deserve special consideration.

Philip Emanuel von Fellenberg (1771–1844) was born in the City of Berne, Switzerland, in 1771. His father was a nobleman; his mother was the granddaughter of Van Tromp, a famous Dutch admiral. His early schooling was received at home under private tutors, his university training in Germany, including a law course at Tübingen. But the influences that shaped his life came chiefly from his parents and from his contact with all classes of people. From his mother he received his love of freedom and his desire to help the poor and unfortunate; from his father an appreciation of the importance of education as a means of social reform; from both, his patriotism, his devotion to the cause of human uplift and his

religious assurance. In a letter written to William C. Woodbridge, editor of *Annals of Education*, in August, 1829, Fellenberg relates several incidents of his early life that made a lasting impression upon him. These indicate how his home life, his university life, his contact with men of note, his ten years of travel and life among the people of his own country, and his brief political career convinced him that the only means of permanent improvement in the social conditions of his own country or any other in which there was so much poverty, disease, ignorance, vice, and jealousy was through the education of all the people. (2—I, 17–23)

He was equally sure, however, that education as he had found it in the schools was not what was needed. Education must be reformed as well as extended. It must prepare each individual to live a useful, happy, and moral life, but in doing so he believed there should be no attempt to disturb the order of society by confounding the classes. He believed that Divine Wisdom had shaped the order of things so that some men were born to rule and others to obey, and, therefore, that each should be educated for his own sphere. He would divide society into three classes, the higher (comprehending the noble and the wealthy), the middling, and the poor. (3—I, 382). In the two extreme classes he saw the greatest defects in education. (Source Material V, A) While he would endeavor "to elevate those whose talents rendered them capable of it, to stations in which society could enjoy the utmost profit from their efforts, he believed that with the mass of the laboring classes, the only rational course was to prepare them for the station in which Providence had placed them, and to render them happy in it by raising them to their proper rank as rational and moral beings." (2—I, 25)

It was also important to maintain the proper relation between the classes. The lower should respect and love the higher; the higher should appreciate and have sympathy for the lower. To accomplish this he would have them brought up side by side. Each could then observe and learn to value the other but without the necessity of mixing or associating. With these views of social reform and an intense patriotic

desire to be of service, Fellenberg decided to devote his life and his fortune to reforming education.

37. **Establishment of the Educational Institution at Hofwyl.** In 1799 Fellenberg purchased an estate of about 600 acres at Münchenbuchsee called "The Wylhof" about four miles from Berne. (Fig. 18) He changed its name to Hofwyl. (4—299)

FIG. 18. CENTRAL GROUP OF BUILDINGS AT HOFWYL
FROM MONROE'S *Cyclopedia of Education*[1]

In describing the place Mr. Woodbridge says:

The approach from Berne is through a wood, which presents no traces of civilization. In issuing from it you come almost immediately in view of the large buildings and luxuriant fields of the establishment. It is situated on a gentle elevation in the midst of an amphitheatre of hills. On the north the view is bounded by the Jura Mountains, and on the south by the Bernese Alps whose tops are covered with perpetual snow. It is surrounded by a valley about eighty feet in depth, which separates it entirely from the neighboring farms and villages. The valley contains two small lakes, and the surrounding scenery is still further diversified by villages and hamlets on the opposite hills. The isolation of Hofwyl, in the midst of villages and at no great distance from a large town, and the combination in its neighborhood of some of the grandest with some of the most beautiful objects of Swiss scenery, were circumstances of no small weight in the view of Fellenberg in reference to his great object. (2—I, 26)

[1]By permission of The MacMillan Company

Fellenberg began the great work he had planned by devoting himself to the improvement of agriculture and by "associating two or three pupils with his own sons and employing private tutors in his own house."

About this time, in 1804, Pestalozzi and his school were obliged to leave the Castle of Burgdorf owing to financial difficulties and because the government had another use for the castle. (2—I, 153) Through the influence of Fellenberg he came to Münchenbuchsee and occupied the Chateau of Buchsee about half a mile from Hofwyl. (cf. 34) Fellenberg believed that through co-operation with Pestalozzi his own plans could best be brought to successful issue, and he would be helping an old friend whom he had known for twenty years. At the request of Pestalozzi, Fellenberg undertook to advance funds and direct the pecuniary affairs of the establishment for one year. "But the strict order and rigid economy, which Fellenberg deemed necessary in a large establishment, ill accorded with the impulses of the good Pestalozzi, whose benevolence was as irregular in its operation as it was ardent in its character." (2—I, 154)

It soon became evident that Pestalozzi and Fellenberg "were made rather to respect each other than to live together. There was as much difference in their characters and ways of thinking and feeling as in their habits and outward appearance." (5—224) "With Pestalozzi the heart was first, with Fellenberg, the mind." Though kind and generous, Fellenberg "had a stern and masterful manner." Pestalozzi could not endure this; he called Fellenberg "the man of iron." In October, 1804, only four months from the time of his arrival at Münchenbuchsee, after a "touching farewell" to teachers and pupils, he left for Yverdun. Within a year the whole institute joined Pestalozzi at the Castle of Yverdun. Although one of the teachers said that there was better order and they learned more at Münchenbuchsee they "found government by Fellenberg less to their taste than no-government by Pestalozzi." (5—344)

Several years later, in 1817, after the financial failure of the school at Yverdun Fellenberg again tried to co-operate with

Pestalozzi. They drew up a satisfactory agreement for the establishment of an institution independent of both Hofwyl and Yverdun. This plan failed because it was opposed by one of Pestalozzi's assistants in whom he had great confidence. (5—326)

38. **Fellenberg's Academy**. As previously stated Fellenberg began his school by taking a few boys into his own family and providing them with tutors. He believed that the best way for an institution as well as a plant to grow was by slow and natural processes. Not until 1807 was the first school building erected, *C* in Fig. 19. This was for the academy or boarding school, or literary institution, or scientific institution, as it has sometimes been called. It was intended for the sons of the well-to-do. (Source Material V, B) It was to be different from other schools of its time in that it was to be conducted in accordance with Fellenberg's ideas of the relationship between the different classes in society; it was to include instruction in science, agriculture, and manual labor, and the teaching was to be done in the spirit of Pestalozzi's method. In the school, according to Robert Dale Owen (1801–1877) who was a student in the academy (or college, as he calls it) in 1819, there was developed a very comprehensive system of student government. (Source Material V, C)

In a few years the academy had eighty pupils and twenty teachers. In 1819 there were more than a hundred students, and from twenty-five to thirty teachers (6—148, 167) As the fame of the school spread abroad the number of students increased. To it came many sons of noblemen, and princes, even, from Württemberg and Russia. A large number of students came from England. (Source Material V, C) The price for board and tuition varied from $500 to $1500 a year. (3—I, 393; 6—161)

The course of instruction in the academy included the Greek, Latin, German, and French languages and literatures, history ("civil and sacred") geography, mathematics ("pure and mixed"), natural and mental philosophy, chemistry, music, drawing, gymnastics (including riding, swimming, and dancing), natural history in all its branches, and religious instruction.

FIG. 19. PLAN OF HOFWYL. FROM *Annals of Education*, VOL. I.

The pupils rise at six in the winter and five in summer; they breakfast at seven, eat a little at ten, dine at noon, take a luncheon at five, and sup at eight. Five hours are appropriated to study in the forenoon and four hours in the afternoon; the rest of the day being devoted to their gymnastic, agricultural and mechanical exercises. This arrangement, however, is not absolutely restrictive, but is made to conform to the varying circumstances of the establishment, the health and genius of the pupils, etc. The greatest pains are taken to cultivate their moral and religious sensibilities. (3—I, 396).

In the academy a teacher was provided for every three or four pupils and the number of pupils in a class was from ten to fifteen. (6—167) The aim was to combine the advantages of private and class instruction. It was the special duty of a teacher to see that each individual under his charge was furnished with just the right kind of nourishment, intellectual and moral as well as physical, so that the habits being formed would lead toward the highest character ideal of which the individual was susceptible.

Physical education was given as important a place in Fellenberg's scheme as either intellectual or moral education. Pure air, a suitable diet, regular exercise and repose were considered essential and it was under this heading of physical education that manual labor was classified in Fellenberg's academy. He believed that regular gymnastic exercises should be insisted on and in addition to these, voluntary exercise through suitable games, excursions, gardening, and the mechanic arts should be provided so that there would be no time for indolence. In order to provide for such voluntary exercise two small buildings, *C* and *C*, Fig. 17, were provided so as not to "interfere with the tranquillity" of the academy building. In these was a cabinet-maker's shop, the bookbindery of the institution, and several rooms devoted to instrumental music, fencing, and dancing. Here, also, was provided a warm bath for use in the winter. (2—I, 27) If a student wished to take his voluntary exercise in other branches of the mechanic arts he could choose between the many workshops on the premises. (3—I, 391) Thus by keeping the students busy Fellenberg would avoid those "vicious habits which so commonly result from the vacant time of colleges and universities. By turning their attention to agriculture and the mechanic arts;

by inspiring them with a love of labour, or at least of a useful application of their strength and muscular activities; by exercising their ingenuity in the use of tools and instruments; by familiarizing them to an attentive observance of nature in her different kingdoms, and in the revolution of seasons,—a foundation is laid for those more expanded feelings and generous sympathies, which bind the upper to the lower classes of the community, and eventually tend to exalt the condition of humanity." (3—I, 398)

It was this point of view that was adopted by the advocates of manual labor in American schools and it was this academy of Fellenberg's that became the model school for the Manual Labor Movement. (cf. 55)

39. **Fellenberg's Farm and Trade School.** When Fellenberg opened his academy in 1807 a schoolmaster by the name of Wehrli (or Vehrli or Vehrly) in the canton of Thurgan urged him to take his son Johann as an assistant. Fellenberg did so, and, to test the young man's character, took him into his own family. Before the end of the first year Wehrli had requested Fellenberg to allow him to take three poor, neglected boys, whom he had found, into the farm house, *L*, Fig. 19, and go there himself and live with them. "Here Wehrli partook of their straw beds and vegetable diet, became their fellow laborer and companion, as well as their teacher." (2—I, 154) Thus was laid the foundation for the farm school, or agricultural school, or "poor school," which became the most striking feature of Fellenberg's institution.

In this school the boys were clothed like farmers and fed very largely on a vegetable diet; meat and wine were served only on Sunday. (3—I, 384) Their daily program varied somewhat from year to year, but, when visited by Woodbridge, was as follows:

> The pupils are awakened at half-past four or half-past five, according to their ages. Half an hour is allowed them for washing and making their beds. After a lesson of one hour in summer, or an hour and a half in winter, they attend to devotional exercises and breakfast. Here the task of each division and individual is assigned for the day by their teacher Vehrli. At eleven they return to dinner, and then have a second lesson of an hour and a half. At five or six, according to the season, they have a piece of bread; and a third

lesson of an hour and a half, and at seven they sup. An assembly is then held for the review of the day, which is closed with devotional exercises, and the younger pupils go to bed. The elder again receive instruction, or occupy themselves in some useful manner.

During the winter, when their employments are not sufficiently active, they pass an hour in the evening in gymnastic exercises or active games. During the summer they are occupied almost entirely with the labours of the field, proportioned to their capacity and strength. The youngest are employed in gathering stones and weeds from the fields. At this season, ten or twelve hours on an average are devoted to labour, and three or four to instruction, when circumstances allow it. During the haying and harvest, instruction is omitted; and the pupils have sometimes volunteered to labour seventeen hours daily; but this is seldom allowed. During the winter they spend seven to nine hours in labour, and receive five or even six hours instruction. The time which is not devoted to the care of the cattle, threshing, and other labours of the farm is employed in making baskets, straw hats, in selecting seeds, and in breaking up stones for repairing the roads. As an additional occupation, as well as a useful one, all the pupils are taught to sew, so far as to mend their own clothes; but to avoid taking them from their work, this task is usually given to the pupils of the girls' school under the direction of the housekeeper.

In addition to this, every pupil has some part of the household economy entrusted to him. One person, for example, is assigned to keep each of the rooms clean; another to take charge of the tools; another the slates; etc., in order to give the habit of responsibility and regularity, as well as to accustom them to their occupations. Their tasks are assigned and superintended by three persons, called the household council, and are changed every three months, in order to accustom all to each branch of duty. Even the children have some little tasks assigned them, that they may imbibe the same spirit and the same habits.

They are also furnished with the opportunities and inducements to voluntary labor on their own account. Each of the younger boys has a little garden spot for vegetables, and another for flowers, which he cultivates himself in his leisure hours. He is allowed no manure but that which he collects from the roads, or from the dry leaves of autumn. He disposes of the productions as he pleases. If he sells them to the establishment, they are credited to him, and at the end of the year, the money is paid to him. He may either employ it, or place it at interest in the establishment, even if only a franc. A fruit tree is also assigned to every two or three boys, who take care of it, and dispose of its fruits in the same manner. The elder pupils assist the younger in these occupations. (2—I, Part II, 10)

In general the methods of teaching in the farm school as well as the academy were those inspired by Pestalozzi. The best intellectual and moral growth was expected to come through slow and natural processes rather than through forcing growth under artificial conditions. Manual labor contributed to this end by helping to provide a natural environment, con-

crete applications of knowledge and rational physical development. Fellenberg's firm belief in the productive system is made evident when he says:

> That only which a man produces by combining the materials presented to him or which he, to a certain degree, reproduces in his imagination until it becomes a part of his own train of thought, can be considered as a real acquisition; or can contribute satisfactorily to the development of his mind. (2—I, Part II, 2)

It was Wehrli's custom to make as many connections as possible in the boys' minds between the school studies and the manual work. While at work in the fields they received some of their most valuable lessons in geography, history, natural science, and geometry as well as religion and morals. Fellenberg believed in the closest possible connection between theory and practice. He said: "Instruction should be followed by action as closely as the lightning by the thunder, and the life should be in complete harmony with the studies."(2—I, Part II, 7)

Wehrli's personality was a large factor in the success of the school—probably the largest, for after he left, the instruction became more formal, and Fellenberg desired another teacher of the Wehrli type. (7—308) He was priest, teacher, elder brother and constant companion. Under his leadership the results were remarkable. Vagrants and beggars became industrious workers; the vicious and lawless became manly and obedient. Through labor and study and contact with a strong, sympathetic, high-minded personality these boys became valuable citizens, and many of them secured positions of trust and large responsibility.

Fellenberg considered agriculture the best means of cultivating those faculties which "promote the permanent happiness of men," but next to agriculture were the mechanic arts. In order to supply the needs of his institution Fellenberg employed mechanics representing several different trades, and each of these had a shop or place to work. Among the skilled workmen were one or more of each of the following: blacksmith, wheelwright, carpenter, cabinet maker, turner, brass worker, shoemaker, harnessmaker, tailor, lithographer, bookbinder. This afforded an exceptional opportunity for a

young man to select and learn a trade. So it came about that when a boy was old enough to become an apprentice, instead of continuing at farm work, he was allowed to select a trade which he would follow during his working hours for the remainder of his life at Hofwyl.

A circumstance which added to the opportunities for learning trades was the interest of Fellenberg in the improvement and manufacture of farm implements. More of such implements were made than were needed in the institution and so the surplus was sold to the neighbors. The income from these sales and from the other productive work of the boys was supposed to pay all, or at least a large proportion, of the cost of instruction. In order that this might be so, the boys from the lower classes of society, who paid no tuition, were bound to remain in the school until they were twenty-one years of age. It was a part of Fellenberg's plan "to show to the world how the children of the poor might be best taught, and their labor at the same time most profitably applied; in short, how the first twenty years of a poor man's life might be so employed as to provide both for his support and his education." (Source Material V, B)

On leaving the school at the age of twenty-one a poor boy had acquired a trade; he was an intelligent practical farmer; and he possessed a general education "quite unprecedented" among the people of his class. Yet he was as hard-working and abstemious as any of them, and he had the best of moral habits and principles. (8—9) For this reason the farm and trade school maintained by Fellenberg was an important contribution to the development of the industrial reform school which has become an established institution. (8—9) As might be expected, the demand for graduates of this school was far greater than the supply.

But in all this learning of trades the handwork, as such, was not taught, except by the imitative methods of apprenticeship. Handwork itself had not been subjected to scientific analysis, and therefore was not taught in the sense that it is taught in most of the trade schools of today. So far as we have evidence to show, it was learned almost entirely by intuition

and imitation. Handwork, as represented in the mechanic arts, had not been "psychologized" or put into pedagogic form.

40. **Fellenberg's School for Girls.** The institution at Hofwyl provided a school for girls which was essentially a branch of the farm and trade school. Its purpose was to "train females for domestic occupation in the same station in life." This school was superintended by the eldest daughter of Fellenberg. It included from twenty to thirty girls from five years of age upwards. Like the boys under Wehrli, they were children of the laboring class, "taken from the highways and hedges." The girls were taught to read, speak, and write their own language correctly and such arithmetic as was "considered necessary to females," especially "mental calculations." Woodbridge describes the manual work as follows:

> The elements of form and linear drawing are taught to such an extent as is necessary to give a correct eye in the ordinary tasks of domestic life, and especially in cutting out and making articles of clothing. The pupils employ their knowledge of this kind in calculating the quantity of cloth necessary for a garment, and the best mode of cutting it and giving it the appropriate form. . . . Spinning, knitting, sewing, and the cutting out and making of garments, are regular and daily subjects of instruction, and the pupils are required to perform, so far as their numbers and capacity admit, all the offices of sisters in making and repairing the clothes of the pupils of Wehrli. . . . The pupils are also made familiar with the useful and noxious plants and animals of the country in the same manner and for the same purpose as in the school for boys. . . .
>
> The principal peculiarity of this branch of Hofwyl is in the domestic education of the pupils. All the domestic duties of the school—cooking, cleaning, washing, etc., are performed by the pupils themselves. These are so distributed, according to the age and strength of the pupils, and are so frequently changed, that each one is made familiar with all the various branches of household economy as early as they are capable of the task. Care is taken that each one shall have some responsibility,—some particular sphere of duty. A pupil who is too young for any other occupation, may have such a little task assigned as keeping a single spot of the yard clean; or collecting all the rags and shreds from the floor, separating the woolen from the cotton, and the useful from those only fit for the paper maker; or taking out and putting up, at the proper time, a single article of furniture; and is then required to perform this as faithfully and punctually as if it were of the first importance. During the mild season they are occupied a part of the day, agreeably to the customs of Switzerland, in light agricultural labors, such as cultivating the garden of the mansion, gathering weeds and stones from the fields, collecting and distributing manure, gathering vegetables, gleaning or assisting in hay harvest. They labor in companies, under the superintendence of a leader like the boys, but always separated from them. It is obvious that

these, and their domestic occupations, constitute the appropriate physical education of these children; and Miss Fellenberg considers their out-door employments as almost indispensable in giving them a constitution adequate to their future labors. Hours of relaxation are given to them, as to the boys, for active amusements.

The day is spent as follows: The girls rise at five o'clock, and are occupied till six in cleaning and arranging their persons and chambers. Each of the younger pupils has an elder sister assigned to her, who must act the part of a mother in doing or superintending these duties for her. Another hour is occupied in committing to memory hymns or portions of Scripture, or odes and cheerful or moral songs, carefully selected. A little before seven o'clock they breakfast; and then receive instruction in reading from the more advanced pupils. At eight, one of the daughters of Fellenberg attends to their instruction in writing. The remainder of the morning, during the winter, is occupied in knitting, spinning, and sewing, accompanied with exercises in language, mental calculation, or singing. A few, in their turn, assist in the kitchen. In the summer, as I have before stated, these occupations are, in some measure, interrupted or varied by agricultural employments.

At half past eleven they dine, and are then employed in the arrangements of the house, or allowed to relax themselves until one o'clock. From one to two o'clock they receive instruction. The remainder of the afternoon is spent like the morning, and at six they sup. From seven to eight is occupied by Miss Fellenberg in reading the Old and New Testament alternately, and in religious instructions and singing, and the pupils retire at an early hour. (2—II, 394–396)

41. **Fellenberg's School of Applied Science.** For the boys of the higher class of society Fellenberg offered the opportunities of the academy, for those of the lower class he provided the farm and trade school; for young men of the middle class he organized a school of applied science, or a "practical institution." For this group of students two buildings, *H* and *H*, Fig. 19, were erected. Here students were "lodged and fed in a more simple manner" than in the academy, but they were "permitted to avail themselves of its lessons." (2—I, 28) They were also permitted to take part in the labors of the farm, of the shops, or of the business office of the institution, "according to their necessities and destination." As Fellenberg was much interested in the improvement of agriculture and the implements of farming, it was quite natural that in this school the study of agriculture should be given most prominence. This school consisted of about twenty young men who had "constant access to the whole of the farm establishment, as well as to the experimental part, of about nine acres." They

were given instruction in the arts and sciences immediately connected with agriculture and such as might assist in the improvement of farm machinery. (8—6) Just how far the experimental work in this department of the institution was carried is not clear, but it is evident that efforts were made in the direction of (1) destroying weeds, (2) better means of working the soil, (3) the use of manures, and (4) the feeding of cattle. (Source Material V, A) An experimental shop was maintained for the improvement of farm machinery. One of the results of this shop was the invention of a "drill or machine for sowing seeds of various kinds by which one half the seed is said to be saved."

The significant fact about this school is that it was an organized effort to develop experimental work in agriculture. It sought to apply the principles and methods of science to farming so far as they were known at that time. In this respect it was a prototype of the modern college of agriculture.

42. **Fellenberg's Normal School.** The success of Fellenberg's institution created a demand very early in its history for teachers who were able to apply the methods used at Hofwyl. More teachers were needed in Fellenberg's own institution, and a much larger number was in demand elsewhere. Fellenberg, therefore, developed a plan for a normal school or seminary for teachers. "The first year forty-two teachers, of the Canton of Berne, came together and received gratuitous instruction in the art of teaching. So great was their zeal that, on finding the establishment was not large enough to receive them, they were contented to lodge in tents. The following year twenty-seven were added to this number from seven other cantons, and a door was opened for regenerating gradually the schools of Switzerland. But the rulers of Berne, without any apparent motive consistent with the spirit of free government, forbade their teachers to attend these instructions on pain of losing their stations." (2—I, 154)

After that experience Fellenberg decided to limit the normal work to the farm school under Wehrli and to receive as students only "those who were employed at the same time as laborers." (2—I, 155) This decision to require all prospective teachers

to perform all the tasks of the pupils, working with them, was considered by both Fellenberg and Wehrli as very important. They believed that all teachers in common schools should "have a thorough acquaintance with the practical labor of a farm." They thought it would be a good thing for all such teachers, and probably all literary men, to continue such work as "an additional provision for their support, and as an invigorating exercise." For teachers "a practical acquaintance with the life and habits of a majority of their pupils is the only means of preparing them fully to enter into the views and feelings of those under their care, to understand their wants and their difficulties, and prepare them for their duties. It also furnishes many important illustrations and topics of remark. It enables them to give much valuable information of a practical kind in connection with the subjects of their studies, and much may be done in this way to extend agricultural improvements. It is also an additional means of securing the attachment of the teachers to those to whom it is desirable their labours should be devoted, and inducing them to continue in this employment." (2—I, Part II, 42)

The course for teachers consisted:

1. "In a thorough study of the branches to be taught." The studying was to be done in common with the other pupils, while in the schoolroom and while engaged in farm work "on the productive plan."
2. "In a series of lessons designed especially for them," in which Wehrli directed them "to the method of communication of instruction."
3. In assuming in turn the place of teachers of their own class under the immediate inspection of Wehrli.
4. In acting in turn as "instructor and monitor to the other pupils, and superintendents of their conduct, under the general direction of Wehrli."
5. "In the daily advice and direction they receive from him (Wehrli) in the discharge of these duties."
6. "In witnessing his (Wehrli's) own methods of instruction as he passes from class to class to observe their progress."

7. "In the discussions connected with the meetings for familiar conversation." (2—I, Part II, 43)

Those who were qualified to do advanced work were "permitted to attend the lessons of the professors" in the academy. Some were even employed "in the instruction or superintendence of the younger pupils in that school." (2—I, Part II, 43) Fellenberg found that some of the best teachers he could obtain for the academy were those who had been trained by this process in his farm school under Wehrli.

As has been previously stated, the principles of teaching behind the methods employed by Fellenberg and Wehrli were those set forth by Pestalozzi. A special feature, however, of the work of Fellenberg was the practical means adopted to provide for the physical, intellectual, moral, and vocational needs of each individual pupil, always taking into consideration the class of society in which the individual pupil was destined to live.

43. **Fellenberg's School Colony at Meykirch.** So many attempts to establish farm schools on the plan of Hofwyl had been failures that Fellenberg sought to demonstrate how it could be done on a smaller scale than Hofwyl. He believed that in a suitable locality under capable supervision a smaller institution could be successful, and that it might have some advantages over such a large one as Hofwyl. One of the first of these advantages would be its isolation. He would have it far removed from sources of moral corruption. A second would be the practical necessity of co-operation; and a third in the fact that the institution would be small enough for each individual to recognize the results of his own labors instead of having them swallowed up in one too large for him to comprehend. In order, therefore, to demonstrate his theory Fellenberg resolved "to establish a colony of children, under proper superintendence, on a piece of uncultivated land, and leave them to earn their own subsistence by their labors, employing the hours necessary for repose from bodily fatigue, in giving them appropriate instruction." In this way he hoped to "provide for their practical and intellectual education with only the capital necessary to establish them, and the aid of a low

price paid by such pupils as might be sent by parents who were not in a state of poverty." He considered that such an institution should not attempt to provide for more than thirty pupils and that about fifteen acres of land would be needed. (2—I, Part II, 189)

In the summer of 1827 he opened the colony at Meykirch with six boys detached from the school at Hofwyl. When they reached the site of their future home they found it was on the side of a mountain with no building on it but a shed. One of their first pieces of work, therefore, was to build a house, using plans and materials previously prepared at Hofwyl. Woodbridge visited the colony just as they were completing their building and gives the following account of what he found:

> There were traces of those imperfections which attend first efforts, and which, in needing to be corrected, serve as a lesson of experience and patience. They were engaged in extending the wings of their building (Fig. 20) for the accommodation of their animals—in digging a cellar, or rather a basement story, which would provide room for their dairy and vegetables during the winter, and also for one or two looms, as means of employing their hours of leisure. Their common bed, for the time, was a large space filled with straw and covered with an immense sheet, on which they reposed side by side. Their food consisted almost exclusively of potatoes, with the milk of their cow, and bread sent from Hofwyl. Their dining room was furnished with slates and books, which indicated that it served also as their schoolroom. Two or three hours in a day were devoted to instruction. A pupil of Wehrli watched continually over their moral conduct, and an improved system of agriculture, which they are required to bring into operation upon uncultivated land, served as a course of practical education. It was delightful to see, in the midst of this solitude and comparative privation, the cheerfulness and activity which pervaded the whole mass of the pupils, as well as the spirit of fraternal kindness which seemed to reign toward each other, and toward their leader. (2—I, Part II, 189)

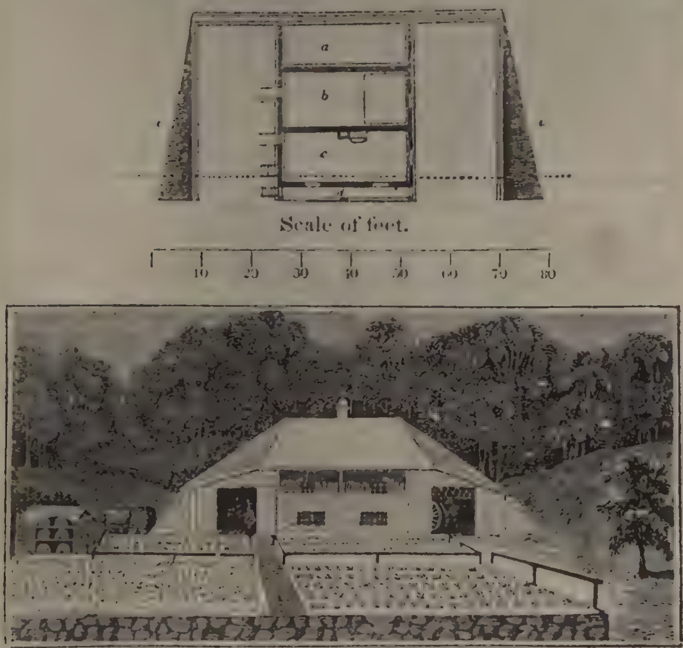
Two years later, in 1829, Woodbridge made a second visit to the colony and speaks of it thus:

> During the year preceding, they had, with the aid of a workman, pierced a passage through a soft sand rock, 5 ft. in height, and 280 ft. in length, into the mountain, to procure water. They had raised a terrace, 15 ft. wide, to serve as a road, and to prevent the ground from washing; and another 20 ft. square and 6 ft. high at the extremity, as a garden spot in front of the house. In addition to this, a spot of 7 acres, covered with wood four years before, was now perfectly cleared, even from stumps, and under fine cultivation, chiefly in potatoes. The tillage of this ground, with their washing, cooking, sewing and weaving, occupied their laboring hours; and four hours daily, on

the average, were devoted to instruction. They attended public worship in a village at the foot of the mountain, and occasionally at Hofwyl.

Their stock consisted of a hive of bees, two cows,—two goats, and two swine. Their food consisted of potatoes, carrots, clotted or curdled milk, and soup made with butter or pork. They had a supply of potatoes, milk, and butter, from their own stores. They had not yet sufficient grass for their cow; and were also dependent on Hofwyl for bread and oil for lights.

a, Stable — *b*, Dormitory — *c*, School and Dining Room — *d*, Piazza — *e*, Banks of Earth.



Back ground and forest — Fore ground — A terrace supported by a wall six feet high, with potatoes and garden vegetables.

FIG. 20. SCHOOL COLONY AT MEYKIRCH.
FROM *Annals of Education*, VOL. I.

In return, they had sent thither during the year a calf, a kid, three pieces of linen of 20 to 30 yds. each, and a quantity of wood.

In order to establish this school, Fellenberg had expended about $7,000 in addition to the purchase money of the land. The latter has been paid in part by wood cut from it; and the value of the spot, in its actual state, far exceeds the expenses incurred.

It is well worthy of consideration, whether such an establishment would not serve best as a moral hospital for those unhappy youths, who are often sent in despair on board ships, or into military establishments, as the only

means of subduing their habits of vice. The isolated situation—the necessary absence of external temptation—combined with a mild but strict discipline, would exert an influence far more favorable to reformation than the corrupting atmosphere of a ship or a camp. I could wish, however, to see it under the direction of parents, that the softening influence of the family state might be added to the subduing power of other means. (2—I, Part II, 191)

Fellenberg said of this experiment:

It is particularly in the labors of the field that Divine Providence appears to have assigned the resources necessary for the education of poor children. But the objects of real philanthropy will be fully attained only in proportion as we can give our pupils the satisfaction of feeling that they are contributing to the good of others, while they are laboring for themselves. This object is especially secured in the colony of Meykirch. . . . The most essential point is to procure instructors whose character is thoroughly proved. Any others might abuse the power entrusted in them. . . . Let us not deceive ourselves concerning the wants of infancy, and the most important objects of education. It is not in reducing too much the difficulties of life, that we can secure the success and happiness of our youth. It is in teaching them to overcome these difficulties with cheerfulness, that we shall best succeed in rendering them happy. (2—I, Part II, 192, 193)

When this colony was discontinued after a few years the estimated improvement of the soil was nearly enough to equal the expenses of the colony over and above the receipts. (7—310)

SOURCE MATERIAL V, A

Fellenberg and His School

From *A Year in Europe* (1818–1819) by John Griscom, Professor of Chemistry and Natural Philosophy in the New York Institute

He is a man of middle age, of a mild and agreeable countenance, and of polite and genteel manners. He seated me on a sofa, and entered upon an explanation of the principles of his establishment, and the particular views of education, which had induced him to engage in it. He considers society as divisible into three distinct parts: the higher (comprehending the noble and the wealthy) and the middling, and the poor. The greatest defects of education, he supposed to exist in the two extreme classes. That these distinctions or classes among men would always prevail, in every civilized country, he believed to be incontrovertible; and, of course, any attempt to break down the distinction would be fruitless. It is, therefore, of consequence that they should be each educated in a manner conformable to their situations, but both in such a way, as to develope, to the highest extent, the best faculties of their nature; and, while it preserves the proper relation between them, it should, at the same time, encourage the feelings of kindliness and sympathy on the one part, and of respect and love on the other. This, he thought, could be effected upon no plan, so effectually, as by bringing them up side by side, so that they should have each other constantly in view, without any necessity whatever of mixing or associating. The rich, by observing the industry, the skill, and the importance of the labouring classes, would learn to entertain just sentiments respecting them, and the poor, by feeling and experiencing the kindly influence of the rich, would regard them as benefactors.

With respect to the best means of cultivating the faculties, which, in their due operation, are to promote the permanent happiness of men, he considers agriculture, as affording opportunities and advantages of the greatest importance, and next to this, the mechanic arts. Agreeably to these leading views, his establishment consists of two distinct parts: a boarding school of the sons of noblemen and gentlemen, in which no pains are spared, to provide them with teachers in every useful science; and of a house, in which boys, taken from the poorest class, are clothed and fed in a very plain, coarse, and farmer-like style, and who work diligently in the field, at employments adapted to their strength and skill. During two hours in the day, in summer and more in winter, they are instructed in letters, and in music. They are likewise introduced into the workshops, and taught the business of a blacksmith, a carpenter, a wheelwright, a cabinet maker, a turner, a shoemaker, or a worker in brass, according as a particular talent for any of these may manifest itself. The produce of the labour of these boys bears no inconsiderable proportion of the expense of their maintenance and instruction.

After this brief explanation of his principles, Fellenberg introduced my companions and myself to Count Louis de Villevielle, a gentleman from the south of France, who, reduced by the revolution, has attached himself to Fellenberg, and appears to live with him, as a sort of companion. He

attends to strangers, and goes with them through the grounds, shops, etc. of the establishment. He proved to be a very sensible, well informed man, and altogether disposed to satisfy our inquiries. He conducted us to the workshops. In one of them, a new and handsome fire engine, of a large size, had just been completed in a style which would do credit to London or New York. In these shops, all the instruments of agriculture are made, and it is the constant aim of the principal, to improve upon the form and structure of them, and to invent others which experience may indicate the use of. As they make more than the farm requires, the surplus is sold to the neighbours.

In the evening the Count conducted us to the farmhouse, where the class of the poor boys are lodged, fed, and instructed. We found them at supper, on a kind of hasty-pudding, with whey and boiled potatoes. They breakfast on a piece of bread and an apple, or something as simple, and dine between eleven and twelve on vegetable food alone. Once a week only (on first day) they have meat and wine. They are thus taught a lesson of simplicity, with respect to their manner of living. The furniture of the house corresponds with the dress and clothing of the boys. After supper they went upstairs to the school room, to take a lesson in music. Their teacher (Vehrly) is a young man of very extraordinary qualifications. He received his early education from his father, who filled, in a distinguished manner, the office of schoolmaster for thirty years. He began at an early age to assist his parent in the discharge of his office. On coming to reside with Fellenberg, his views were further expanded, and he entered with enthusiasm into the concerns of the establishment, and willingly undertook the formation and direction of the class of the poor, in all their exercises, agricultural, literary, scientific, and moral. He lives with them, eats, sleeps, and works with them, dresses as they do, and makes himself their friend and companion, as well as their instructor. He is eminently fitted for such an occupation by his genius, his address, his temper and disposition, and above all by his religious principles. The school room serves also for a shoemakers' shop, and probably accommodates, occasionally, the tailor and harness maker. The boys always take a lesson of one hour, between supper and bed. This lesson is frequently confined to music. They are taught it by principles, but they use no instrument but their vocal organs. Fellenberg lays great stress on music, as a means of bringing the mind and heart into harmony with truth, and of inspiring the mild and benevolent affections. He thinks it has been very beneficial in reclaiming many of these boys from the vicious habits they had acquired from the low and exposed lives they had been subject to. By teaching them to sing religious songs, together with those that are simply patriotic, he says their attention is diverted from those vile ballads which are common among low bred people; and that they find, in this new entertainment, a happy substitute for the coarse and vulgar expressions to which they were addicted. The boys of this class appeared to be very healthy and contented. They are taught to pay the utmost attention to cleanliness. Their clothing in summer is of coarse cotton, and in winter, of woollen cloth. They go barefooted, except when they work in the fields, or when the state of the weather requires them to wear shoes and stockings. They are always without anything on their heads. Many of them, as might naturally be supposed, entered the school with the seeds of scrophulous disorders; but by the effect of a simple

and wholesome diet, cleanliness, and labour, they are restored to health with scarcely any medicine. Some of them, on their entrance, were feeble and debilitated, unable to endure cold, heat, or labour; but when once they have become accustomed to the regimen of the school, they willingly encounter rain, storms, and severe cold, whenever their work calls them abroad, without shrinking from, or regarding the exposure. They are taught to mend their own clothes. In summer they rise at five, and in winter at six; and after having dressed themselves and said their prayers, they receive instruction for an hour. They then breakfast, after which they go to work until half past eleven. They have then half an hour for dinner; after which Vehrly gives them a lesson of one hour. They work out till six, and after eating their supper, receive further instruction, which concludes with prayer, and they are generally in bed between eight and nine o'clock. But this distribution of time varies according to the seasons. In winter five or six hours a day are devoted to sedentary instruction. The morning of the first day of the week, is always devoted to exercises of piety, and after dinner some hours are given to instruction in sacred history. But their lessons are by no means confined to the school room. Vehrly takes pleasure in questioning them on subjects of natural history, geography, religion, morals, or any other useful topic, while they are at work in the fields or shops; and it may readily be conceived, that with the devotion to the improvement of his pupils, occasions will perpetually present themselves, of conveying instruction in every kind of knowledge, calculated to expand the minds of children, and to cultivate their best affections.

With regard to the most effective means of eliciting the powers of the mind, and of conducting the literary exercises of young people, great credit is due to Pestalozzi, whose veteran labours, as one of the most enlightened teachers of the age, were well known and acknowledged long before the commencement of the Hofwyl Institution. His plans of communicating knowledge, are in a great measure, practised by Vehrly. Much pains are taken to impress on the minds of the pupils, a deep sense of the importance of time, and of habits of industry; and from the reports that have been published by commissioners appointed to examine the establishments, it is evident that the most favourable results have attended these endeavours. The children are so effectually redeemed from their former vicious habits, that, in their most free and noisy sports, not an expression is heard, offensive to innocence or good manners. After working 10 hours in the day, they give themselves up, when their teacher permits, to the liveliest recreation; but a word from Vehrly, is sufficient to induce them to leave their sport and to engage in some other exercise. The progress which they make in knowledge, is truly surprising, when it is considered how adverse their former habits have been to all intellectual abstraction. In a few years, or even in less time, they learn to read, write, and calculate with and without the use of pencil or pen; the elements of drawing become familiar to them; and they acquire good notions of geometry, especially in its relation to field surveying, and its application to descriptive drawing. Botany and mineralogy constitute part of their amusements. They become well acquainted with all the plants of Hofwyl, and their different qualities, both the salutary and noxious. Of the minerals also, they acquire the names and principal uses, and they make collections of

all that is valuable and curious in minerals and vegetables. Some of them are very attentive to the improvement of their little cabinets. The principal, when walking with them in the fields, is often called upon to decide disputes relative to the nature of stones or vegetables. But the most admirable trait in the character of this school, is the tone of religious feeling which, it is said, pervades it. This could not be accomplished, were not Fellenberg and Vehrly, both strongly imbued with a sense of religious obligation, and unremittingly attentive to awaken those sentiments in the minds of the pupils. They have learned by heart more than 50 hymns, and many portions of sacred history. They are regularly attentive to one practice, which is a pleasing source of instruction, and at the same time serves to demonstrate the progress they have made in useful acquirements. At the close of every week, they write, in a book provided for the purpose, an account of whatever has impressed their minds with the greatest force. It may be either a moral reflection, a description of a plant, or an instrument, an account of a conversation, or an extract from something they have read. We saw some of these journals; they were mostly in the German language, and the greater number were written with remarkable neatness. Some of them contained drawings that evinced no inconsiderable skill, and an eye accustomed to accuracy of observation.

It will readily be conceived that a plan of instruction so admirable, and constantly directed to the best and purest affections of the mind and heart, can scarcely fail to redeem from indolence and vice, those whose habits have been the most degraded. And it has accordingly happened, that notwithstanding the boys under Vehrly's charge have been taken from the very lowest ranks, some of them the children of beggars, but one instance has occurred, of such inveterate vice, as to render it eventually necessary to abandon the culprit to his corrupt propensities, and expel him from the school.

In the religious exercises, which take place on the first day of the week, the boys of the poor school assemble with the superior class, but on no other occasion.

After seeing the evening exercise of these boys, we retired to an inn, at the village of Buchsee, about a quarter of a mile from Hofwyl. This was only a village inn, but we found in it good beds, and good attention.

3d. After breakfast, we repaired again to Hofwyl, and were conducted by the Count, first, to the place where the agricultural instruments are deposited. The drill or machine for sowing seeds of various kinds, by which one half the seed is said to be saved, has been improved by Fellenberg. The *exterminator*, for destroying weeds, and the *scarificator*, for paring the soil, were among the things in this collection: but I was surprised, when Fellenberg, in reply to my questions, informed me, that no attempts had been made to improve the common plough. That which appears to be in universal practice in Switzerland, is probably the same used by the great grandfathers of the present race, and is much more awkward and clumsy than the English plough. The mouldboard is only a flat plank placed at an angle with the beam. This plank is often changed to the other side of the plough, at each end of the field, so as to throw the furrow always in one direction, but for what reason it is difficult to imagine, except, on the side of a steep hill, there may be some advantage

in casting the furrows downward. But, as these ploughs are constructed, I am persuaded, it requires nearly or quite double the team, to perform a given quantity of labour, as in America. I noticed in the yard, a new sleigh, designed to hold about eighty persons, and to be drawn by fourteen horses. This is intended for the amusement of the higher class of boys. The snow is often very deep in this part of Switzerland, and continues some months. The stables exhibited a collection of the largest cows I ever saw. They are kept to the stalls all the year and are fed with grass in the summer. The greatest care is taken to economise the manure. The yard, which receives the litter, is made concave, and has a well in its centre, whence water is thrown over it in dry weather. A large reservoir, lined with stone, received the wash of the stables, which is from time to time, thrown over the contents of the yard. The cows were mostly fat enough for good beef. They seldom give more than twenty-four bottles in a day, and, upon an average, not more than sixteen bottles, or about twelve quarts. We were next conducted round part of the farm. It consists, in the whole, of 240 acres, and certainly affords a neat specimen of agricultural skill. (3— —)

SOURCE MATERIAL V, B

Fellenberg's School

From Lord Brougham's address before the Education Committee of Parliament

At a time when men's minds are turned towards the great questions connected with the character and support of the poor, with universal education and the poor laws, there is nothing more natural than that the first intimation of Mr. Fellenberg's plans should powerfully interest the thinking part of the community. He is the head of a most respectable Patrician family in the Canton of Berne, and possesses, about four miles from the city, an hereditary estate, sufficiently large for one of his station, in that frugal country, though trifling, indeed, if compared with the great things he has effected by the judicious disposition of it. Fond of study, and particularly attached to agricultural pursuits, he early in life devoted himself to the praiseworthy objects of improving his estate by his own industry, and of making this occupation subservient also to the improvement of the condition of the poor in his neighborhood. His plans, now in full action, astonish all who visit Hofwyl. The distinguishing excellence of Mr. Fellenberg's operations consists in his economising his resources. His farm consists of about 220 acres, which he has improved with great success, and continues to cultivate himself. It is here the poor children are employed to the number of about forty, and this may be said to be the branch to which all the others are more or less subordinate, and with which they have all some connexion. The other branches are an academy for the sons of wealthier persons, an agricultural institute connected with a small experimental farm, and a manufactory of farming machinery and implements. The academy consists of fifty or sixty pupils, chiefly of Patrician families, with several German princes and young nobles of that nation among them. These boys are taught every branch of useful learning. In teaching the sciences, considerable aid is derived from the method of Pestalozzi, which consists in exercising the reasoning faculties

more than is done by the ordinary plan of instruction, and in making the process much less a matter of rote. Carpentry and gardening are added, as means of filling up the hours of relaxation.

The character, the temper, and the habits of the pupils, are the paramount objects of the superintendence exercised over them, but so as never to oppress or annoy. The methods of preserving this watchful attention, and at the same time leaving the pupils free from a sense of restraint, are among those processes which no description can sufficiently represent. The great principle seems to be an appeal to the well-known force of habit, and a judicious variation of their pursuits and studies, united with a never-failing gentleness and serenity of temper in the instructors and guardian. The pupils eat at Mr. Fellenberg's table, which is plentiful, yet simple; they are all treated in precisely the same manner, whatever be their rank. The agricultural institution consists of about twenty young men more advanced in years, who have constant access to the whole of the farm establishment, as well as to the experimental part, of about nine acres, attached to this part of the establishment. They are instructed in the book learning also of the subject, and of the arts and sciences immediately connected with it, and assist in the improvement of machinery. The manufactory of machinery and implements consists of two branches—one of common husbandry tools, as well as of those improved at Hofwyl: the other intended to carry on improvements in this essential article. The former furnishes a profit which defrays the expense of the latter; for it not only supplies the farm, but leaves a surplus of machinery and tools for sale. The pupils of the academy are instructed in the handicraft arts. Those of the agricultural institution in those immediately connected with that branch, and the other class in trades of blacksmith and wheelwright, which may in after life afford them a support. Those boys that are taken into these establishments from the lower grades of life are bound to remain until they arrive at the age of twenty-one years.

Mr. Fellenberg was first known merely as an agriculturist, and still keeps up his original establishment of husbandry. But agriculture was with him a secondary object, and subservient to that system of education to which his thoughts were very early directed. He is a man of an unusual, ardent, as well as persevering turn of mind, and conceals a character of deep and zealous resolution, under a very calm exterior. It appeared to him that a sounder system of education, for the great body of the people could alone stop the progress of error and corruption. He determined to set about the slow work of elementary reformation by a better mode of education, and to persevere in it for the rest of his life; to show to the world how the children of the poor might be best taught, and their labor at the same time most profitably applied; in short, how the first twenty years of a poor man's life might be so employed as to provide both for his support and his education. Many of his first pupils were the sons of vagrants, and this is the case of one or two of the most distinguished. This part of his establishment has increased to about forty. Punishment has been inflicted only twice since the beginning (the establishment has been in operation many years); and their treatment is nearly that of children under the paternal roof. Mr. Fellenberg observes, that the boys being many of them only just come to the age of productive labor (for he began with a small number), it is presumed the establishment

will not only support itself in future but repay past expenses, particularly as certain outfits charged the first years will not recur again.

Habits of industry, frugality, veracity, docility, and mutual kindness, are carefully inculcated. A short time is employed in their mental instruction each day, after breakfast and dinner, before their going to work. The labors of the field, their various occupations, their lessons, and the necessary rest, fill the whole of the twenty-four hours; and, judging from their open, cheerful, contented countenances, nothing seems wanting to their happiness. But it is a great point gained to have brought young men to the age of eighteen or twenty, uncontaminated by the general licentiousness which prevails. Long habits of self-restraint will enable them to look out, with comparative patience, for a suitable establishment, before they burden themselves with a family. Young men brought up at Hofwyl must obtain a decided preference in all competition. Nor is this preference a matter of supposition. Mr. Fellenberg has already applications for twice the number of lads in his school, who might be advantageously placed at any time, if their patron thought them sufficiently qualified, and if it was right for them to leave the establishment before it was remunerated by their labor. Two only have left the school before the end of their time. One has become the manager of a large estate, which has since doubled its proceeds. This young man was originally a beggar boy, and not particularly distinguished at school. The other directs a school, and acquits himself to the entire satisfaction of his employers. None of them look inattentive or tired, although just returned from their day's labor in the fields. Contrivance, and some degree of difficulty to overcome, is a necessary condition, it would seem, of our enjoyments. The prince, whose game is driven towards him in crowds, and who fires at it with guns put ready loaded into his hands, is incomparably sooner tired of his sport, than he who beats the bushes all day for a shot.

Mr. Fellenberg is deeply imbued himself with the sense of religion: and it enters into all his schemes for the improvement of society. His first care, upon rescuing those poor children from wretchedness, is to inspire them with the feelings of devotion, which he himself warmly entertains—the conversation as well as the habits, partake largely of religious influence. The evidences of design, observable in the operations of nature, and the benevolent tendency of those operations, form constant topics of discourse in their studies, and during the labor of the day. When the harvest once required the laborers to work after nightfall, and the full moon rose in great beauty over the magnificent mountains that surround Hofwyl, suddenly, as if with one accord, the boys began to chaunt a hymn, which they had learnt, among many others, but in which the Supreme Being is adored as having lighted up the great lamp of the night, and projected it in the firmament.

The Bible is read aloud on stated days, and other suitable books, in which the German language abounds. Their music is of the simplest sort; the notes written on a blackboard, the pupils copy in their books. They sing each part separately first, and then together—in general, very correctly, and in good taste. In order to encourage the attachment to property acquired by their own industry, the pupils are allowed certain emoluments, such as the proceeds of the seeds they collect, etc., which accumulates and forms a fund for the time of their going away. These boys will leave the institution at the

age of twenty-one, understanding agriculture practically, acquainted with a trade, and with a share of learning quite unprecedented among the same class of people, and yet as hard-working and abstemious as any of them and with the best moral habits and principles. (8—6–9)

SOURCE MATERIAL V, c

A Former Student's Account of Hofwyl

From *Threading My Way* by Robert Dale Owen

We entered the college then having more than a hundred students, natives of every part of Europe, and from fifteen to twenty-three years of age. I was speedily inducted into some of the wonders, social and political, of the little republic of which I had become a member.

We of the United States assert that, in our country, the rights of the person are more liberally acknowledged and more strictly assured than in any other great nation. We have beautiful theories of government. We boast of our universal suffrage. We live under a Constitution framed by wise ancestors. We are governed by laws enacted by the consent of the governed.

Yet if a governmental system is to be prized either according to the spirit in which it is administered, or by the practical results obtained through its agency, the democratic *Verein* (Union) of Hofwyl was, in a very small way, more of a success than the American Union with its forty millions.

I found the students living under a *Verfassung* (constitution) which had been drafted by a select committee of their number, five or six years before, adopted by an almost unanimous vote of the whole body, and approved by Mr. Fellenberg's signature. This constitution and the by-laws supplemental to it (drawn up by the same committee) were subject to amendment, Fellenberg retaining a veto; but during the three years I remained at college, scarcely any amendments were made.

This embraced the entire police of the institution. Neither the founder and president nor the faculty issued any rules or regulations. Our professors had no authority whatever except within their class-rooms. Our laws, whether defining official duties, or relating to household affairs, hours of retiring, and the like, or for the maintenance of morality, good order, cleanliness, and health, were stringent, but they were all strictly self-imposed. A breach of the laws was an offence against the Verein; and as to all such we ourselves had sole jurisdiction. I cannot doubt that Fellenberg kept unobtrusive watch over our doings; but while I remained at Hofwyl he never openly interfered with our legislation or our domestic proceedings, by veto or otherwise.

And while punishment by the college authorities held no place, as restraining motive, among us, neither was any outside stimulus of reward, or even of class rank, admitted. Emulation was limited among us to that which naturally arises among young men prosecuting the same studies. It was never artificially excited. There were no prizes or college honors, no "double-firsts," to be won; there was no acknowledged position, marked by numbers, giving precedence and conferring name and fame; there was not even the excitement of public examinations; we had no Commencement exercises that might have assembled the magnates of Switzerland to criticise or to applaud.

A dangerous experiment it would usually be pronounced; the more dangerous because of the heterogeneous materials that had come together at Hofwyl from half the nations of the world,—Swiss, Germans, Russians, Prussians, French, Dutch, Italians, Greeks, English, and I know not of what other nationalities,—some having been nursed and petted in luxury, others sent thither, probably, because their parents could not manage them at home. The difficulties were the greater on account of the comparatively late age at which students were received, many of them just from schools where teachers were considered natural enemies, where severity was the rule, and artificial reward the trusted stimulant to exertion. Yet I am witness to the fact that this hazarded experiment was an eminent success. It was a triumph in self-government. The nobler elements of our nature had been appealed to, and the response was prompt and ardent. . . .

On his estate of Hofwyl, purchased in 1809, he commenced first a workshop for improved farm implements; two years later an industrial school, called the Vehrli School, from the excellent young man who conducted it. It had thirty scholars in 1815, and forty or fifty when I first saw it. The children, from seven to fourteen years old, and chiefly destitute orphans or sons of indigent peasants, were employed in farm work eight or nine hours a day, and had two hours' instruction in summer and four hours in winter. This school became self-supporting after a few years. Besides the ordinary branches, the children were taught drawing, geometry, natural history, and music. We did not see much of the *Vehrli-Knaben* (Vehrli boys), as we called them; but there was the kindest feeling between our college and their school; and I never saw a happier-looking set of children than they. I think M. de Fellenberg considered this industrial experiment of more importance, as a reformatory agency, than our college. . . .

Our course of instruction included the study of the Greek, Latin, French, and German languages, the last of which was the language of the college; history, natural philosophy, chemistry, mechanics; mathematics, a thorough course, embracing the highest branches; drawing, in the senior class, from busts and models; music, vocal and instrumental; and finally gymnastics, riding and fencing. There was a riding-school with a considerable stable of horses attached; and the higher classes were in the habit of riding out once a week with M. de Fellenberg, many of whose practical life-lessons, given as I rode by his side during these pleasant excursions, I well remember yet; for example, a recommendation to use superlatives sparingly, in speech and writing, reserving them for occasions where they were needed and in place.

The number of professors was large compared to that of the taught, being from twenty-five to thirty; and the classes were small, containing from ten to fifteen. Twice or thrice only, during the term of my residence, one of the students, on account of repeated inattention during a recitation, was requested by the professor to leave the room. But this was quite an event to be talked of for a week. No expulsion occurred while I was there. I do not myself remember to have received, either from M. de Fellenberg or from any of the faculty, a single harsh word during the happy years I spent at Hofwyl.

Latin and Greek, though thoroughly taught, did not engross as much attention as in most colleges. Not more time was given to each than to ancient and modern history, and less than to mathematics. This last, a special

object of study, was taught by extempore lectures, of which we took notes in short-hand; and in after years, when details and demonstrations had faded from memory, I have never found difficulty in working these out afresh, without aid from books. (6—148–167)

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CHAPTER VI

The Followers of Pestalozzi and Fellenberg

44. Popular Interest in the work of Pestalozzi and Fellenberg.—The present chapter and the one that follows it are intended to bring within the range of vision the most significant of the various beginnings of handwork in education during the period which was introduced by Pestalozzi and Fellenberg and continued to about 1870 when the manual arts were subjected to analysis and organized in pedagogical form comparable to the older subjects in the school curriculum. It covers that period of rapid social development after the American Declaration of Independence, after the French Revolution, after the invention of the steam engine in 1765 and of textile power machinery that immediately followed, and after Adam Smith had published his book, *Wealth of the Nations*, enhancing the social value of labor and the laborer. In this period there was a definite effort to extend education to the working classes of society. This very naturally meant devising means of providing education at small expense, such as the system devised by Lancaster in England, which enabled one teacher to give instruction to a larger number of pupils, and the various adaptations of Pestalozzi's scheme of utilizing the labor of the children to defray all or a part of the expenses of education. During these years, also, the social-economics value of education was demonstrated in enough cases to encourage greatly increased appropriations of both public and private funds for educational purposes.

It was at such a time that the educational ideas introduced by Rousseau, which had been developed, promoted, and made the subject of experiment by Pestalozzi, and then organized into practical administrative schemes by Fellenberg, had a powerful influence.

To Burgdorf or to Yverdun came such eminent Germans as Fichte, the philosopher, Karl Ritter, the geographer, and Karl von Raumer, the historian of education. Officials and educators came from many countries to study the new education and make reports. Kings and princes—even the Czar of Russia—took an interest in the methods of Pestalozzi. Pupils came from England, France, and Sweden as well as from the various states of Germany. Nearly every nation in Europe was represented. Likewise, to Hofwyl came statesmen and educators from most of the countries of Europe and even from America to observe and to write reports of their observations. Foreign students, also, came to study there. It is not surprising, therefore, that Pestalozzian methods and the new types of schools developed by Fellenberg should immediately become the subject of discussion, experiment, and test in many countries by progressive educators. And as a matter of course, these discussions and tests involved manual labor and skilled handicrafts in one way or another as a part of the new educational program.

45. **Heusinger the forerunner of Froebel.** In 1797, Heinrich Gottlieb Heusinger (1766–1837), professor of philosophy and pedagogy at the University of Jena, wrote a pamphlet on how to utilize the child's desire for activity, *Über die Benutzung des bei Kindern zuthätigen Triebes beschäftigt zu sein,* in which he made manual work the central point of his system. (1—62) He maintained that "the impulse of activity is to be used as a means of education in every way, since it leads man to avenues of knowledge which would otherwise remain closed to him" (2—38). Upon the principles stated in this pamphlet Froebel built up his system a few years later. It is interesting to learn that a copy has been discovered bearing marginal notes in Froebel's handwriting. (3—138) A year or two later, in 1798 or 1799, Heusinger published an educational novel, *Die Familie Wertheim,* in which are set forth some of the practical applications of his ideas. In this he lays down seven rules concerning instruction in manual work

1. That the work should correspond with the powers of the child.
2. That the work should not be unhealthy.

3. That the work should not be executed in a sitting posture, but by movements when standing.

4. That the work should be not merely a foundation for artisan's work, but for general education.

5. That the materials used should be as various in character, and furnish as great variety in the forms of objects, as possible.

6. Great stress should be laid on the relations between work and the implanting of knowledge.

7. The sense of form and beauty should be developed. He recommended the use of cardboard, wood, metal, clay, bone or horn, and wax. (3—138)

It is not clear that Heusinger was acquainted with the work of Pestalozzi. We know, however, that he was acquainted with the work of Blasche. (1—62) (cf. 29)

46. **The Prophetic Vision of Niemeyer.** In the same year that Pestalozzi came to Burgdorf, 1799, Augustus Hermann Niemeyer (1754–1828), great-grandson of Francke, and professor of theology at the University of Halle, published an important book on the principles of education, *Grundstätze der Erziehung und des Unterrichts*, in which he set forth as of first consideration the harmonious development of all the faculties with which man is endowed (4—650). In the application of this principle he recommended the use of manual arts. He said:

Aptitude in various handicrafts strengthens the body, and, at the same time, provides a useful form of activity, and serves to occupy the weary, idle hours, especially in the monotonous existence of the household. They can be altered to suit the season. The best of occupations—which cannot be too highly recommended—is gardening, which almost everywhere, and especially in the country, offers most convenient and most agreeable opportunities. Health is gained; the young gardener learns to labor "in the sweat of his brow"; he lives in close contact with Nature, and learns her laws and her methods better than from books; he has to exercise patience; he teaches himself through his errors; he witnesses a creation of his own in miniature, springing up under his eyes; he finds from experience how much it is worth to enjoy the fruits of his own labor. And at other times other handicrafts, especially mechanical ones, afford entertainment, teach handiness, and exercise the body. Carpentry is acknowledged to be the most suitable of all, on account of the complexity of the work and the tools, and because it does not put too great strain upon the strength of the young. Turning, also, gives exercise, trains the senses, and imparts artistic taste. Above all, it is well that the young should become familiar with the ordinary tools of a household, of which, moreover, one has such constant need· for example, the saw, axe,

gimlet, hammer, etc. To keep these things anxiously out of the children's reach is the most certain way to reduce to helplessness, and, in time of need, to make them more liable to injury. (3—140)

Again he says:

The more incessantly we employ the children, the more we can shield them from evil habits, and create in them a desire for the good. Children for whom otherwise there seemed no hope needed but very little correction as soon as a means of keeping them actively employed was found. To discover an occupation suitable to each stage of development is without doubt the important work of every educational system. (5—67)

In these statements we seem to catch a reflection of the experiences of Francke at Halle (cf. 26) and, in harmony with the efforts of Pestalozzi, a looking forward to the time when handwork shall become an organic part of every educational system.

47. **Herbart's View of Manual Arts.** While Pestalozzi was at Burgdorf there chanced to be at Berne a young man who later became one of the world's great educational philosophers, Johann Friedrich Herbart (1776–1841). He was there as the private tutor to the three sons of the governor of Interlaken. Herbart had left the University of Jena early in 1797 before completing his course, at the suggestion of his mother who said that he had "no thought for anything but jurisprudence in the morning and philosophical speculation in the afternoon," and she thought that his association with friends, especially a young clergyman in Berne would be more valuable than so much study. (6—1) This was the mother who had directed his early education and definitely planned it "to cultivate clearness, definiteness, and continuity of thought." Under her guidance he had developed extraordinary intellectual power. He began logic at the age of eleven, metaphysics at twelve. (7—3) He left the *Gymnasium* at eighteen "distinguished among his school fellows for order, good conduct and unceasing industry in developing and improving his excellent natural abilities." At the University he became a student of philosophy under Fichte, and later, for a time, one of his enthusiastic disciples.

It was with this background of training that Herbart very unexpectedly took up the work of a teacher and became

acquainted with Pestalozzi. It is not surprising that he could not be satisfied with some of the work at the school at Burgdorf. On the other hand, it is clear that he gained much from contact with Pestalozzi and his school.

Concerning the manual arts Herbart seems to have said but little, yet he, and especially some of his followers, would give them a place among the means available in teaching some of the other school subjects, and also as a means of discipline. In one of his lectures he says: "Children in any case must be occupied, as idleness leads to mischief and unruliness. If the occupation is some useful work (such as manual or field labor), so much the better. And better still, if, by means of the occupation, something is taught and learned which contributes to future culture. But not all occupation is instructive, and where the government of children is already difficult, then learning is not the most suitable occupation. Many grown-up boys are better brought under control with an artizan, a merchant, or a farmer, than in the schools. The sphere of government is wider than that of instruction." In this instance it would seem that Herbart is not thinking of manual work as an organic part of the school, but as an auxiliary means in the case of unruly boys. (6—126) Possibly he had in mind such an organization as the farm and trade school at Hofwyl, for he was once a teacher in that institution. (4—299) In his *Umriss pädagogischer Vorlesungen*, however, he says:

> Every growing boy and youth should learn to handle the recognized tools of the carpenter, as well as the ruler and compass. Mechanical dexterity would often be more useful than ability in gymnastics. The one helps the spirit, the other the body. Elementary schools should have workshops, though they should not actually be technical schools. And every man should learn to use his hands. The hand holds the place of honor at the side of the power of speech in raising man above the beasts. (3—139)

48. **Froebel and his Doctrine of Self-Activity.** The direct heir to the educational ideas of Pestalozzi was Friedrich Wilhelm Augustus Froebel (1783–1852). It was he who took Pestalozzi's idea of organic growth and developed it into the doctrine of self-activity which he made the very center of his

educational theory. He took Pestalozzi's practice of training in observation and sense perception and expanded and systematized it until he produced the kindergarten gifts and occupations.

Froebel was the son of the Lutheran pastor of Oberweissbach, a village in the Thuringian Forest. His mother died while he was still an infant, and, consequently, he suffered from neglect and a step-mother. A maternal uncle took pity on him, gave him a home, and sent him to school, where his mind, "busy as it was for itself, would not work for the masters," and he passed for a dunce. At the age of fourteen he was apprenticed for two years to a forester. During this period his mind fed freely upon his observations of nature, and when he left the forest at the age of seventeen he seems to have gained ideas that greatly influenced his thinking throughout life. He went to the University of Jena for a year, where he proved to be a misfit. Then he was sent to learn farming, but was recalled on account of his father's failing health. The next few years after his father's death he worked in one part of Germany and then in another—"sometimes land-surveying, sometimes acting as accountant, sometimes as private secretary." While studying architecture at Frankfort-on-the-Main, he became acquainted with the director of a model school who had caught some of the enthusiasm of Pestalozzi. This friend persuaded him to give up architecture and become a teacher. From his very first experience in teaching he realized that he had at last found his life work, and he was happy. After two successful years of teaching he left the school to undertake the education of three boys, but as he felt the need of more preparation for teaching he induced the parents of the boys to allow him to take them to Pestalozzi's institution at Yverdun. During the two years following, 1807–1809, he was "drinking in Pestalozzianism at the fountain head, and qualifying himself to carry on the work which Pestalozzi had begun." In 1811 he resumed his university study, first at Göttingen and then at Berlin, but it was interrupted again when he joined the Army and went through the campaign of 1813. At the close of the war he became the curator of a museum of mineralogy in

Berlin. (8—385–390) These varied activities, however, did not divert his mind from education. On the contrary, they enriched his background of experience and gave him new friends.

In this connection it is interesting to notice the fact that like Rousseau (cf. 27) and Pestalozzi (cf. 32) the early life of Froebel did not flow in a quiet channel, that he did not fit the school ideals and conditions of his time, and that he gained much of his preparation for life work through practical experience in a variety of comparatively unrelated occupations, yet they somehow wove themselves together into an effective background of experience and knowledge—a background that no academic course of the time could have provided. In the case of each of these three great reformers, there is a close correlation between their experiences in early life and their theories of education.

In 1816 Froebel gave up his position in Berlin to take charge of the education of a niece and four nephews. The next year he moved his little school from Griesheim to Keilhau, another Thuringian village. This became the nucleus around which he built up an institution and an educational community that enabled him to demonstrate his theories. During the nine years at Keilhau he wrote *The Education of Man*, his most important book, which was published in 1826. Suffering from unjust religious persecution he left Germany for Switzerland, but found no comfort in the change. Finally the Swiss Government induced him to move to Bergdorf to establish a public orphanage and superintend a training course for schoolmasters, but official restraints irritated him, and he returned to Germany, where, in 1837, in the village of Blankenburg near his former home, Keilhau, he opened the first school known as as a *Kindergarten*. (8—394)

The high place of handwork in Froebel's scheme of education is indicated in the following quotations from *The Education of Man:*

The debasing illusion that man works, produces, creates only in order to preserve his body in order to secure food, clothing, and shelter, may have to be endured, but should not be diffused and propagated. Primarily and in

truth man works only that his spiritual, divine essence may assume outward form, and that thus he may be enabled to recognize his own spiritual, divine nature and the innermost being of God. (9—32) . . . .

The young, growing human being should, therefore, be trained early for outer work, for creative and productive activity. For this there exists a double reason, an inner and an outer requirement; and the former, inasmuch as it includes the latter, is of the greatest importance and eternal. The requirement is supported, too, by the nature of man as such.

The activity of the senses and limbs of the infant is the first germ, the first bodily activity, the bud, the first formative impulse; play, building, modeling are the first tender blossoms of youth; and this is the period when man is to be prepared for future industry, diligence, and productive activity. Every child, boy, and youth, whatever his condition or position in life should devote daily at least one or two hours to some serious activity in the production of some definite external piece of work. Lessons through and by work, through and from life, are by far the most impressive and intelligible, and most continuously and intensely progressive both in themselves and in their effect on the learner. Notwithstanding this, children—mankind, indeed—are at present too much and too variously concerned with aimless and purposeless pursuits, and too little with work. Children and parents consider the activity of actual work so much to their disadvantage, and so unimportant for their future conditions in life, that educational institutions should make it one of their most constant endeavors to dispel this delusion. The domestic and scholastic education of our time leads children to indolence and laziness; a vast amount of human power thereby remains undeveloped and is lost. It would be a most wholesome arrangement in schools to establish actual working hours similar to the existing study hours; and it will surely come to this. (9—34)

In 1829, in outlining a proposed school, Froebel again gave proof of the fundamental place he would give to handwork in education:

The institution will be fundamental, inasmuch as in training and instruction it will rest on the foundation from which proceed all genuine knowledge and all genuine practical attainments; it will rest on life itself and on creative effort, on the union and interdependence of doing and thinking, representation and knowledge, art and science. The institution will base its work on the pupil's personal efforts in work and expression, making these, again, the foundation of all genuine knowledge and culture. Joined with thoughtfulness, these efforts become a direct medium of culture; joined with reasoning, they become a direct means of instruction, and thus make of work a true subject of instruction. (9—38)

The translator of *The Education of Man* gives a list of the kinds of work Froebel recommended:

Froebel proposed to devote the forenoon to instruction in the current subjects of school study, and the afternoon to work in the field, the garden,

the forest, in and around the house. His list of occupations comprised the preparation of wood for the kitchen and the furnace; the making of simple wooden kitchen utensils; the weaving and binding of mats for the table and for the floor; the binding of books and the ruling of slates and practice-paper; the making of a variety of collections of objects of nature and art, and of suitable boxes for these objects; the care of the garden, the orchard, the field; the plating of straw mats for the hot-beds, and basket-making; the care of pigeons, chickens, ducks, etc.; the preparation of artistic and geometrical forms with paper in folding, cutting, and mounting, pricking, weaving, interlacing, etc.; the use of pasteboard in the making of stars, wheels, boxes, napkin-rings, card baskets, lamp-shades, etc.; play with splints, tablets, sticks and peas; the whittling of boats, windmills, water-wheels, etc.; the making of chains and baskets from flexible wire; modeling with clay; drawing and painting; and many other things. (9—38)

Froebel's plan for carrying out such a program failed, but its formulation pointed the way for other educators who came later. It was, however, in the *Kindergarten* that Froebel did have the opportunity to put into practice such of these and other forms of handwork as were applicable in the training of young children. His "gifts" and his "occupations" were a vital factor in his *Kindergarten.* The gifts were playthings consisting of typical geometric forms which were intended to give the children "new universal aspects of the external world." These were given to the child to be played with, built with, but without change in their forms. The occupations consisted of material, like clay or paper, which could be readily changed in form to suit the whim or fancy of the little builder. The gifts stood for law; the occupations for freedom. "The gift invites only arranging activities; the occupation invites also controlling, modifying, transforming, creating activities. The gift leads to discovery; the occupation, to invention. The gift gives insight; the occupation, power." (9—287)

The gifts were as follows:

1. Six colored worsted balls,[1] about 1½″ in diameter.
2. Wooden balls, cylinder, and cube 1½″ in diameter.
3. Eight 1″ cubes forming a 2″ cube.
4. Eight brick-shaped blocks, 2″ x 1″ x ½″, forming a 2″ cube.
5. Twenty-seven 1″ cubes, three bisected and three quadrisected diagonally, forming a 3″ cube.

[1]It is said that some children playing ball in a meadow near Burgdorf about 1835 suggested to Froebel that the ball is the simplest plaything for the child. (9—285)

6. Twenty-seven brick-shaped blocks, three bisected longitudinally and six bisected transversely forming a 3″ cube.
7. Wooden tablets: squares derived from the faces of the second- and third-gift cubes, also equilateral triangles.
8. Lines: straight splints of various lengths, and circular metal or paper rings of various sizes—whole circles, half-circles, and quadrants.
9. Points: Beans, lentils, or other seeds, leaves, pebbles, etc.
10. Reconstruction: This gift enables the child to reconstruct the surface and the solid synthetically from the point, using sharpened sticks or straws and softened peas or wax pellets.

The occupations are classified into four groups:

1. Solids: made from plastic clay, cardboard, wood, etc.
2. Surfaces: made from paper, parquetry, paint, etc.
3. Lines: made use of in interlacing, weaving, embroidery, drawing, etc.
4. Points: represented in stringing beads, buttons, etc., and in perforating. (9—287)

In teaching drawing and painting Froebel often used a "net-work," or cross-ruling of horizontal and vertical lines, as a guide. A slate ruled in a net-work of equal squares was therefore an important item of school equipment. (9—289)

With the viewpoint of Froebel stated, the marked difference between the viewpoints of Herbart and those of Froebel become apparent. Froebel would place handwork at the very center of his educational system. With Heusinger (cf. 45), he believed that man is born for action; that as activity precedes thinking, education must begin with doing; and that from this impulse to activity all education must evolve. On the other hand, Herbart would use handwork as a means of teaching the recognized school subjects of his time. He would use it as a method or device while Froebel treated it as a subject of instruction. (2—45) Excepting, possibly, in the *Kindergarten*, neither Froebel nor Herbart went much beyond Pestalozzi, and perhaps not as far as Blasche, in analyzing handwork and putting it into the best form for instruction.

49. **Wehrli's Normal School at Kreuitzlingen.** After twenty-three years of service in Fellenberg's institution at Hofwyl (cf. 39) as the originator, organizer, and developer of the farm and trade school, and later as director of the normal school, Johann Jakob Wehrli (1790–1855), in 1833, accepted the

management of a normal school at Kreuitzlingen on the shore of Lake Constance. He had received several invitations to found an institution in Germany, but preferred to remain in his own country. At Kreuitzlingen, Wehrli was given a further opportunity to put into practice his theory of training rural school teachers by combining the usual school studies with farm work and instruction in the art of teaching. (3—852) Thus, for twenty years more he labored in the interests of the education of the peasant children of Switzerland, and became the recognized expert and adviser in this particular field. From all parts of Europe people came "to consult him on systems and methods, to see his college, to ask his opinions, and to tell him of the progress and efforts of national education in their own districts." (10—II, 373) Throughout Switzerland, for a part of this period, Wehrli's normal school was regarded as a model, and in greater or less degree the other normal schools of the country adopted his viewpoint on the training of teachers.

Wehrli believed that successful teachers of the children of the poor must be friends and associates of the poor, yet well educated. They must be humble and willing and able to labor as peasants labor. He had seen the ill effects of sending young men to colleges where they lived in luxury, and then allowing them to teach in peasant schools. They were misfits; they often became dissatisfied with their surroundings, and gave up teaching to become clerks. To avoid this, and to insure the confidence and co-operation of the peasants, he would make the student's life "as simple, and even more humble and laborious than the teacher's village life," so that when he became a teacher he would enjoy greater ease than during his years of preparation. (10—II, 367)

Wehrli would have a large farm attached to the normal school and require the students to spend four hours every day in cultivating it and doing the housework of the institution. In this way he would diminish the annual expense of the school by one-fifth. (Source Material VI, A.) All these ideas were carried out in his school at Kreuitzlingen. The course of instruction (Fig. 21) suggests how this was done in 1839.

COURSE OF INSTRUCTION

PURSUED AT THE NORMAL SEMINARY IN THE CANTON OF THURGOVIA, SWITZERLAND, UNDER THE SUPERINTENDENCE OF M. VEHRLI, IN THE SUMMER HALF YEAR OF 1839.

HOURS.	CLASS.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.	SUNDAY.
5 to 7	First .	Out-door labor,	Out-door labor,	Art of teaching,	Out-door labor,	Out-door labor,	Art of teaching.	Attending divine service, sacred music, teaching in Sunday school.
	Second.	Out-door labor,	Out-door labor,	Out-door labor,	Art of teaching,	Out-door labor,	Out-door labor.	
7 to 8	. .	Breakfast,	Breakfast,	Breakfast,	Breakfast,	Breakfast,	Breakfast.	
8 to 9	First .	Natural history,	Biblical history,	Profane history,	Natural history,	Biblical history,	Profane history.	
	Second.	Profane history,	Biblical history,	Management of land,	Profane history,	Biblical history,	Management of land.	
9 to 10	First .	Grammar,	Grammar,	Natural history,	Grammar,	Grammar,	Natural history.	
	Second.	Geometry,	Arithmetic,	Grammar,	Geometry,	Arithmetic,	Grammar.	
10 to 11	First .	Singing,	Singing,	Grammar,	Singing,	Singing,	Grammar.	
	Second.	Grammar,	Grammar,	Geometry,	Grammar,	Grammar,	Geometry.	
11 to 12	First .	Arithmetic,	Geometry,	Geometry,	Arithmetic,	Geometry,	Arithmetic. .	
	Second.	Natural history,	Natural history,	Art of teaching,	Natural history,	Natural history,	Art of teaching.	
12 to 1½	. .	Dinner and gymnastic exercises,	Dinner and gymnastic exercises,	Dinner and gymnastic exercises,	Dinner and gymnastic exercises,	Dinner and gymnastic exercises,	Dinner and gymnastic exercises.	
1½ to 3	First .	Singing,	Writing,	Drawing,	Singing,	Writing,	Drawing.	
	Second.	Writing,	Drawing,	Violin,	Drawing,	Singing,	. . .	
3 to 4	First .	Geography,	Arithmetic,	Arithmetic,	Geography,	Arithmetic,	Writing.	
	Second.	Arithmetic,	Geography,	Natural history,	Arithmetic,	Geography,	. . .	
4 to 5	First .	Geometry,	Reading,	Repetitions,	Geometry,	Reading,	. . .	
	Second.	Reading,	Geometry,	Arithmetic,	Reading,	Geometry,	. . .	
5 to 6	. .	Supper,	Supper,	Supper,	Supper,	Supper.	Supper.	
6 to 9	. .	Garden-work, house-work, conversation,	Garden-work, house-work, conversation,	Garden-work, house-work, conversation,	Garden-work, house-work, conversation,	Garden-work, house-work, conversation,	Garden-work, house-work, conversation.	

FIG. 21. DAILY PROGRAM OF CLASSES IN WEHRLI'S NORMAL SCHOOL IN 1839. FROM BARNARD: *National Education in Europe*

50. **The Wehrli Agricultural Schools.** In a previous section (cf. 36) attention was called to the fact that the institution at Hofwyl gave a great impulse to three types of schools that followed: the agricultural school, the industrial reform school, and the manual labor school. The first of these took definite shape almost immediately in Switzerland, and such schools came to be known as Wehrli schools. These schools were intended for the completion of the education of the sons of farmers after they had left the elementary schools. Here they received what for that time was an excellent education in the science of agriculture, including chemistry, mathematics, history, geography, and the languages. A large farm was attached to each school, which was well stocked with cattle and farming implements. For five or six hours every day the boys learned practical farming under an experienced farmer. The produce of these farms was expected to pay the cost of instruction, so that the board and tuition could be kept at a low enough rate to be within the reach of the poorest farmers. In this respect, however, they did not always come up to the expectation of Wehrli. But a great many of these schools were established throughout Switzerland and did much to improve the system of farming. In fact, these schools, established in nearly every canton, were a large factor in bringing the Swiss farms to the point where they yielded a greater return for the outlay than those of any other country in Europe. (10—II, 371)

Joseph Kay of England, who visited Switzerland in 1844, said:

> On a Swiss farm nothing is wasted. Everything that can be converted into manure, such as the drainings of the yards, stables, cow-houses, kitchens, offices, etc., is collected and spread over the fields, after having been prepared in such a manner as to suit the particular character of the soil of each farm. No room is lost in the arrangement of the fields and plots of land. No stones or rubbish is left upon the land to injure the crops. The soil is cleaned as well as if it were garden land. It is always well drained, and is never injured by a too frequent repetition of the same kind of crops. The cattle, too, are well tended. Their ailments are understood, and the kind of treatment proper for their cure. A richer milk and butter is thus obtained, as well as more of it. (10—II, 373)

Mr. Kay reported Wehrli's statements concerning the results of these schools as follows:

He said that pauperism was diminishing; that the prudential habits of the people were rapidly improving; that their tastes were rising; that they were beginning to dress better and better; to build better houses; to furnish them better; to lay by more against bad times; and, in a word, to become more intelligent, civilized, independent, and happy. . . But he said to me over and over again: "You cannot educate your peasants unless you educate your teachers first. To make a good teacher requires a very careful, long, and special education. A bad teacher or a stupid teacher does much more harm than good." (10—II, 374)

51. **Oberlin and the First Infant School.** In France the influence of the schools under Pestalozzi and Fellenberg was preceded by the notable work of John Frederick Oberlin (1740–1826) who began his work in 1766 in the mountain parish of Waldbach, not far from Strasburg. In this isolated community Oberlin not only completely transformed the social, religious, and economic life, but in the process he established what is supposed to have been the first infant school. It became the model for one in Paris which preceded the *écoles maternelles;* it was visited by Robert Owen shortly after he established the first infant school in Great Britain; and it preceded the *Kindergarten* of Froebel by more than twenty years.

"Observation and experience had convinced Oberlin that, even from the very cradle, children are capable of being taught to distinguish between right and wrong, and of being trained to habits of subordination and industry." (11—74) In this school, instruction "was mingled with amusement." "During school hours, the children were collected on forms in great circles. Two women were employed, the one to direct the handicraft, the other to instruct and entertain them. Whilst the children of two or three years old only were made at intervals to sit quietly by, those of five or six were taught to knit, spin, and sew. Colored pictures were used in teaching Scripture subjects and natural history." (11—75)

The older children in the elementary schools were made familiar with the abundant flora of the region. They were encouraged to search for plants in the summer "of which they had learned the names and properties during the winter, and

to transplant them into little gardens of their own, which their parents had been induced to give them for the exercise of their industry and skill. They were also taught to draw the flowers; an art in which some of them succeeded remarkably well." (11—81) As a means of impressing upon the minds of the youth their duty to contribute toward the general good, each was expected, before receiving religious confirmation, to plant two young trees. (11—82)

52. **Robert Owen and his School at New Lanark.** With the invention of the power loom in England it became possible to use more laborers with less strength and skill in the making of cloth. This fact and the resulting competition in industry, brought thousands of children into the factories. Indeed, the demand for cheap labor was so great that the pauper children of the workhouses were bargained for by the owners of factories and delivered in droves, the workhouse authorities being glad to get rid of them. These children were often housed in sheds, or in the factories, given the poorest kinds of food, and the beds in which they slept were no sooner vacated by a day shift than the night shift took possession of them. They were entirely at the mercy of those who regarded them solely as implements of labor. The treatment and suffering of these children was "heart-rending in the extreme." (12—37) Even when the picture was not so dark as this and the children slept and ate at home with their parents, the system was monstrous. In 1796 the Manchester Board of Health while investigating the spread of contagious diseases pointed out some of the flagrant evils of the system. This report was the beginning of an agitation against the evils of the factory system that continued for years. The first Factory Act, of 1802, limited the hours of labor to twelve between 6 A. M. and 9 P. M., required that instruction in the three R's should be given to apprentices, and included certain other regulations—mostly sanitary—together with a weak system of inspection. When Watt attached his steam engine to the machinery of the factories, the industries began to move to the centers of population where they could hire children living at home without any apprenticeship agreement, thus making the law almost useless.

In the discussion leading up to this law, and in what followed for many years, affecting the labor and education of factory workers, Robert Owen (1771–1858), a successful factory manager and later the founder of English socialism, took an active interest. He was acquainted with factory conditions and desired to see them changed. As he studied the problem he became convinced of the importance of education in any permanent change for the better. In 1799 he became manager and part owner of the cotton mills of New Lanark not far from Glasgow in Scotland. Here he immediately began to apply his theories of social reform, but not without opposition. In a few years, however, he had won the confidence of the community. As a result of his experiences and study he declared, in an address at a public dinner given in honor of Joseph Lancaster, that man is the product of his environment. "Man," he said, "becomes a wild, ferocious savage, a cannibal, or a highly civilized and benevolent being, according to the circumstances in which he may be placed from birth." From this he argued for the education of the poor so that every child should find a place in the schools. (12—100)

In 1816, he established at New Lanark his famous infant school, which was the first in England. In 1818 he visited the infant school of Oberlin in Alsace—and the schools of Pestalozzi and Fellenberg in Switzerland. (13—1240) The first master for his school was a weaver, James Buchanan, illiterate and without professional training, but he was selected because "he does not know how to teach what is found in books, but he does know Nature and loves children, and by that love will bring Nature and the children together." (14—221) Buchanan was assisted by a girl of 17 years. They were especially instructed by Owen not to use harsh words or actions in dealing with the children, and the children were not to be "annoyed" with books. "Instruction was to be by familiar conversation on objects around them." Pictures, physical exercises, singing, and dancing were prominent features of this school.

One hundred children between the ages of two and five years were taught in this school and six hundred over five years of age in a higher school. Half of those in the higher

school were between five and ten years and were in the day school. The other half were ten years or over and, as they worked in the factory during the day, constituted the night school. (14—213)

The schools at New Lanark were conducted in the spirit of Pestalozzi, and attracted the attention of social reformers, statesmen and educators from all parts of the British Isles and from many foreign countries. The following account by John Griscom of New York who visited the school during the year 1818–19 gives the impression made upon an American teacher:

A neat and commodious building has been erected for the purpose of instruction, in a pleasant spot near the centre of the village. The manufactories close uniformly at half past six; hence none of that overstraining by which the health of children and young people are so much injured in other manufacturing towns, is here permitted. The evenings of the youth are devoted to the schools, and as many of the adults as choose, may also avail themselves of the instruction of the teachers. The first room we entered was a singing school, in which were both boys and girls, arranged on benches, and singing in chorus, under the direction of an instructor. On listening to the words of the song, judge my surprise on finding, that, instead of a hymn, it was a love song, beginning with, "And will you love me, deary." Passing into the next room, I found there a music school. Half a dozen or more little fellows had each a flute, and were piping it away in notes that did not preserve the strictest accordance. The next apartment we entered, was a large room for reading, writing, and arithmetic. Some of the pupils in this room were pretty well advanced in age. From this we went into a large room above-stairs, where were fifty or sixty young people, both boys and girls, attending to the lessons of a dancing-master. These young students of the "merry mood," were not equipped in all the gaiety of a fashionable ball-room; though there was, probably, as great a diversity of costume as would be seen in a "belle assemblée" of Paris or Edinburgh. In fact, they were in much the same style as that in which they had left the manufactory,—some with shoes and others barefoot. The dancing-master, too, was the painter and glazier of the village; who, after handling the brush all day, took up the fiddle in the evening, and instructed his motley group in the profound mysteries of the highland reel.

"Owen's aim in all this is to make his villagers a moral and happy people. He wishes to relieve their minds and bodies as much as possible from the fatigues of labour, and he goes to work in his own way. He does not, I believe, compel any of his subjects to dance; but, if they choose it, he gives them the opportunity of learning how. Human nature, he says, is not understood by any class of society, and he has discovered that dancing is one of the means of reforming vicious habits. This he thinks it effects by promoting cheerfulness and contentment, and thus diverting the attention from things that are

vile and degrading. Before the evening school closes, the pupils all collect into one room, and sing a hymn." (15—II, 377)

The viewpoint of an Englishman, Chandos Lord Leigh, reporting a later stage in the development of the school, is taken from an excerpt from his journal, dated 1827, and published in 1920 in the London *Times Educational Supplement:*

> We went to the singularly interesting school of Mr. Owen, of Lanark, at New Lanark (Scotland), placed among the cotton mills, where we saw the new system of education acted upon in full vigour, all the sciences learnt by little children, the offspring of the surrounding poor, who at the age of 10 are to be transplanted into the cotton mills; we saw these little children, who at other times are running about in the dirt, without shoes or stockings, dancing quadrilles in the most elegant style. They are taught botany, natural history, geography, etc. I was over and over again assured that these accomplished poor children become the most active, sober, and docile workmen. The children are not kept in strict subordination in school, and are allowed to run quite wild when out of it. They, however, are always ready with a reply when any question is put to them, and pay great attention to the remarks of their teachers. The school rooms are very airy and large.

Light is thrown on the social and educational conditions of the time when one learns that in his speeches and writings on factory legislation, Owen was contending that no child under ten years of age or one unable to read should be employed in factories. He proposed that schools be established for the special benefit of factory employes where reading, writing, and arithmetic should be taught. He maintained that the number of hours in the mills, including two for meals and recreation, should not be more than twelve and a half a day.

53. **The New Harmony Educational Experiment.** Not content with the results of a quarter-century of effort in the field of social and educational reform in Britain, and being subjected to religious persecution and misrepresentations of various kinds, Robert Owen came to America in 1825 to start a "new moral world." He purchased the 20,000 acres belonging to the Raffite community at Harmonie, Indiana, and re-named the settlement New Harmony (Fig. 22). Associated with him as educational director was another man of wealth, William Maclure (1763–1840) a retired merchant of Philadelphia, who had visited him in 1819 and in 1824 at New Lanark. Maclure

Fig. 22. New Harmony as it was during the Owen Occupation
From Lockwood: *The New Harmony Communities*

had travelled seven summers in Switzerland, and each of these summers he had spent considerable time at Pestalozzi's school at Yverdun. He had visited the institution of Fellenberg, also, and was much interested in his scheme of teaching agriculture and his efforts to make the school self-supporting, but "he did not find the democratic atmosphere at Hofwyl which he regarded as so essential in the up-building of a system of popular education." He considered that Fellenberg ruled the institution at Hofwyl in a dictatorial manner. "Pestalozzi, on the other hand, was the essence of democracy." (16—43) In 1805 Maclure had endeavored to secure the services of Pestalozzi in establishing a school in Philadelphia, but, being unsucessful in this he engaged a former assistant of Pestalozzi, Joseph Neef (1770–1854). (16—44) This first Pestalozzian school in America was opened in 1809, and was successful for three years until it was moved out of the city into a small community. There it failed, and Neef went to Louisville, Ky. When Owen and Maclure took over the community at New Harmony, Neef joined them in the capacity of schoolmaster. (16—72) Owen's aim in his "new moral world" was to develop a new social organization which would "rationally educate and employ everybody." This would "give a new existence to man by surrounding him with superior circumstances only." (14—59) Maclure's aim was to make New Harmony the educational center of America through the introduction of the Pestalozzian system of instruction. (16—50)

Although neither of these aims was accomplished, this social experiment had a far-reaching influence upon the development of American education. It became the center of a group of eminent scientists; it emphasized equal educational privileges for both sexes; and it put into operation in America some of the ideas of Pestalozzi and Fellenberg in reference to manual labor as a part of a scheme of education.

"The infant school at New Harmony, receiving children from two to five years of age, was the exact counterpart of Owen's infant school at New Lanark; the higher school, enrolling those from five to twelve years of age, was the reproduction of the night school which Owen conducted for the

benefit of the operatives of his New Lanark mills." (14—238) This higher school was taught by Joseph Neef, as principal, assisted by his four daughters and one son, all of whom had been pupils of Pestalozzi and had been brought to the community because of their familiarity with his system of instruction. (14—241) An article outlining the course of study was published in *Sillimans' Journal* early in 1826. In this article Maclure said that the children were to learn arithmetic by a machine called the arithmometer, geometry by a trignometer, mechanism, by the study of machines or exact models of them, natural history by examining the objects or accurate drawings of them, anatomy by skeletons or wax figures, geography by globes and maps—most of the last of their own construction, hygiene by their own experience and observation of the consequences of all natural functions, and natural philosophy by the most approved and simple instruments. (14—237) Writing, drawing, music, gymnastics, languages were included and then the handwork was described as follows:

> Lithographing and engraving as well as printing are to be carried on in the school building, as well as other mechanic arts, that the children may receive manual training.[1] The boys learn at least one mechanical art—for instance, setting type and printing, and for this purpose there are printing presses in each school by the aid of which are published all their elementary books. (14—238)

There was a third school for pupils over twelve years of age which was spoken of as the "school for adults." The pupils of this school received special instruction, usually at night, in "mathematics and the useful arts," lectures on chemistry, drawing, natural history, and experimental farming.

Of these three, the second was the real Pestalozzian school and it was to the industrial department of this school that Maclure contributed most of his energy. He believed that "every child of the productive classes should be taught a trade in order that he may be self-supporting and independent." He believed, also, with Fellenberg, that, "if properly

[1]This is the earliest use of the term "manual training" that the author has found, and in this case the word "manual" is merely an adjective modifier of "training." The union of the two words has not yet become significant.

managed, the labor of the child at his trade in the industrial department should more than pay for his maintenance and entirely relieve the public from the financial burden of supporting the schools." (14—242) In Maclure's scheme "the child was permitted to choose the branch in which he wished to be trained. Where he made no choice, the management sought to assign him to one for which he had special aptitude." "Every child was expected to learn at least one occupation or trade well. When this had been done he might receive permission to enter another workshop and learn a second industry." (14—243)

It appears certain that at some time or other during the life of the industrial school at New Harmony each of the following useful occupations were taught: Taxidermy, printing and engraving, drawing, carpentry, wheelwrighting, wood-turning, blacksmithing, cabinet making, hat-making, shoemaking, agriculture, washing, cooking, sewing, housekeeping, dressmaking, and millinery. Whatever may have been the character of the training in other departments, there is absolute proof that the work of the printing shop was thorough. Maclure's *Opinions*, a publication in three volumes, was printed and bound by the pupils in it. The typographical work of these books is excellent, and after the lapse of eighty years the binding is in good condition. (14—243)

The Duke of Saxe-Weimar visited the schools of New Harmony and in 1826 wrote the following:

I found Professor Neef in the act of leading the boys of his school out to labor. Military exercise formed a part of the instruction of the children. I saw the boys divided into two ranks and parted into detachments, marching to labor. On the way they performed various wheelings and evolutions. All the boys and girls have a very healthy look, are cheerful and lively, and by no means bashful. The boys labor in the field and garden and were now occupied with new fencing. The girls learned female employments; they were as little oppressed as the boys with labor and teaching; these happy and interesting little children were much more employed in making their youth pass as happily as possible...We saw, also, the shops of the shoemakers, tailors, and saddlers, also the smiths, of which six were under one roof, and the pottery, in which were two rather large furnaces. The greater part of the young girls whom we chanced to meet at home we found employed in plaiting straw hats. (14—244)

Unfortunately, there were such strong differences of opinion developed among the leaders at New Harmony that, as a social community, it collapsed after two years and Robert Owen returned to Scotland. Maclure remained at New Har-

mony for a year and tried to develop new educational projects. First he announced an "Orphan's Manual Training School," then a "School of Industry" and finally "The Society for Mutual Instruction," but all were failures.

That Maclure took an advanced position in reference to industrial training is clear from his *Opinions* which contains the following:

> Being taught to make shoes or coats does not force the possessor of such knowledge to be a shoemaker or a tailor, any more than learning mensuration or navigation obliges one to become a surveyor or sailor. They are all acquirements good to have in case of necessity, and in no state of society is that necessity more likely to occur than in our system founded on liberty and equality, where the only bar to the most complete equalization of the whole population is the ignorance of the great producing classes, which, however, is vanishing rapidly before the increasing means of obtaining useful knowledge; and children ought to be trained and educated to suit the probable situation which the circumstances of the next age may place them in. Even at present, all our farmers and manufacturers, nine-tenths of our population, would be very much benefited by possessing one or two of the mechanic arts suitable to their occupations. (14—261)

54. **Bronson Alcott's Temple School in Boston.** While Maclure and Neef were endeavoring to apply the educational principles of Pestalozzi at New Harmony, an American philosopher-teacher, Amos Bronson Alcott (1799–1888), who knew nothing, or very little, of the work of Pestalozzi, was applying Pestalozzian principles in a school at Cheshire, Connecticut. (16—147) Like the great Swiss reformer, Alcott's educational thought and practice was a generation ahead of the time in which he lived. His ideas were not popular, except with the progressive thinkers; he was too radical, yet many of the reforms he advocated and put into operation in the schools he taught have become the standard practice of today.

Alcott was born in Wolcott, Connecticut. He was the son of a small farmer and mechanic. Much of his youth was spent in peddling books and other wares and in teaching in the Southeastern states—Virginia, and the Carolinas. In 1823 he returned to New England. He taught a district school in Bristol, Connecticut, and in 1825 took charge of a school at Cheshire in the same state. In 1827 he was invited to write an account of the organization and methods of his school for the

American Journal of Education. (16—149) But his ideas were too advanced to suit the community in which he taught and he moved to Boston in 1828 where he opened first an infant school and later a private school. In 1830 he accepted a teaching position in Philadelphia, but returned to Boston in 1834 and opened his unique school in the Masonic Temple where, during the next five years, he put his educational theories into practice as he had never been able to do before. For assistants in this school he had two women who afterwards became distinguished as educators and writers, Elizabeth Palmer Peabody (1804–1894) and Sarah Margaret Fuller (1810–1850). (16—154) But Alcott's troubles did not end with the opening of the Temple school. His religious views, when made public, reduced his thirty pupils to ten, and when he admitted a colored child, the number was reduced to five—his own three daughters, the child of a staunch friend and the colored boy. The school closed in 1839 and the next year he retired to Concord where he was associated with Emerson, Hawthorne, Thoreau, and Channing and became the "dean of the Concord School of Philosophy."

Alcott looked upon the early education of a child as a "leading of the young mind to self-education," and his chief concern was always for moral and spiritual culture. In working out his school program, he first made three divisions of the school activities which he considered as corresponding to the three-fold nature of childhood. These were (a) the spiritual faculty, (b) the imaginative faculty, and (c) the rational faculty. Under each of these he listed the various school subjects and activities, and then tried to have the weekly program provide a proper balance of each. "Writing and sketching from Nature" are found in the list for training the imaginative faculty. Alcott does not seem to have made use of the other manual arts, but he made such effective use of drawing and by such progressive methods that this deserves special consideration. It should be noticed that in the teaching of this subject he went far beyond Pestalozzi in using drawing as an educational means. In Pestalozzi's scheme of education instruction in drawing was interminably tied up with geometry; it was too

cramped and restricted. Pedagogically speaking, it was a step in advance of previous teaching of the subject because it was based on an analysis of form (cf. 35), but it did not lead out very far into the world of beauty in Nature nor stimulate freedom of expression. In the Temple school the teacher of drawing, Francis Graeter, seems to have caught the vision of Alcott and shaped his work accordingly. In Miss Peabody's *Record of a School* she says of Alcott: "He thinks that the forms of Nature, as furniture for the imagination, and an address to the sentiments of wonder and beauty and also as a delight to the eye, and as models for the pencil, cannot be too early presented, or too lovingly dwelt upon." (17—XXI) . . . "He surrounds them, also, with statuary and pictures in his schoolroom; and he has drawing taught to all his scholars by a gentleman who probably possesses the spirit of art more completely than any instructor who has ever taught in this country." (17—XXII) . . . "Let children sketch from Nature, cultivate flowers, cherish animals, keep shells, and pretty stones." (17—XXIII)

The following quotations from the journals of students, extracts of which are given in the appendix to Miss Peabody's book reveal much concerning the subject-matter and methods of teaching drawing in Alcott's school:

> Today is *one* of the pleasantest days that I have passed at this school. and my journal is writen rather better than usual After recess I gave my drawing of a girl to Mr. Graeter and he altered it and made it a great better and made a tree over her head it looked very pretty. my drawing to-day was the bust of Shakespear, but I did not succeed very well. The next Tuesday we shall bring a flowerpot (with the plant in it) for Mr. Graeter. Mother has a great many so I can copy from one of hers. (17—180) I wrote my journal and then drew a map and finished my spelling lesson in my book and wrote the meaning of the words (17—182) our drawing today was some blocks. we shall draw for next time a fire place or a stove. (17—183) After recess Mr. Alcott told us to draw the New-England States from memory I succeeded better than I expected to. (17—184) At twelve o'clock Mr. Graeter came to teach us drawing however we did not draw on tablets but on paper. I drew the bust of Sir Walter Scott (17—192) I wrote a letter to Mr. Graeter in which I thanked him for consenting to draw me the schoolroom which I intend to send on to my father and mother as a new years present. (17—193)

Alcott was also a pioneer in schoolroom decoration. "Believing that the objects which meet the senses every day for years, must necessarily mould the mind, he felt it necessary to choose a spacious room, and ornament it, not with such furniture as only an upholsterer can appreciate, but with such forms as would address and cultivate the imagination and heart."

In the four corners of the room, therefore, he placed upon pedestals, fine busts of Socrates, Shakespeare, Milton and Sir Walter Scott. And on a table, before the large gothic window by which the room is lighted, the Image of Silence, "with his finger up, as though he said, beware." Opposite this gothic window, was his own table, about ten feet long, whose front is the arc of a circle, prepared with little desks for the convenience of the scholars. On this he placed a small figure of a child aspiring. Behind was a very large bookcase, with closets below, a black tablet above, and two shelves filled with books. A fine cast of Christ, in basso-relievo, fixed into this bookcase, is made to appear to the scholars just over the teacher's head. The bookcase itself is surmounted with a bust of Plato.

On the northern side of the room, opposite the door, was the table of the assistant, with a small figure of Atlas, bending under the weight of the world. On a small bookcase behind the assistant's chair, were placed figures of a child reading and a child drawing. Some old pictures, one of Harding's portraits, and several maps were hung on the walls.

The desks for the scholars, with conveniences for placing all their books in sight, and with black tablets hung over them, which swing forward when they wish to use them, are placed against the wall round the room, that when in their seats for study, no scholar need look at another. On the right hand of Mr. Alcott is a sofa for the accommodation of visitors and a small table with a pitcher and bowl. Great advantages arise from this room, every part of which speaks the thoughts of Genius. It is a silent reproach upon rudeness. (17—1, 2) (Fig. 39, page 420)

55. **The Manual Labor Movement in America.** As previously stated, (cf. 38) Fellenberg's academy furnished the inspiration for the Manual Labor Movement in America. This movement began during the years from 1825 to 1830, reached its height about 1834 and in less than ten years more had spent its force as an educational movement. In certain schools, however, it left a type of work which grew and became permanent.

Fellenberg's academy was for the upper classes of society—for young men who could pay high tuition. Consequently, the manual labor for these students was not performed to earn money or reduce living costs but as a means of physical train-

ing. It was considered educationally in the same class with fencing, dancing, and gymnastics. In Fellenberg's farm and trade school, however, the manual labor was a means of paying for instruction and living expenses. In democratic America these two aims were combined. The early advocates of manual labor saw in it a means of preserving the health of students and also of enabling many young men to secure an education who could not do so otherwise on account of its cost. The need for both better health and more money was greatest among the students in the theological seminaries and so it came about that these institutions took the lead in the movement. The American Education Society, devoted to the promotion of ministerial education, through its publication, the *Quarterly Register and Journal* championed the cause of manual labor, and the secretary of this Society, Rev. Elias Cornelius (1794–1832), who was also the editor of its publication, was regarded as the leading spirit in the movement. His office in Boston became the headquarters for information concerning manual labor schools. In Volume II, Number 2 of the *Register*, November 1829, he published a summary of the movement up to that time, and in the same number the results of a questionnaire he had sent to schools in various parts of the country known to have adopted the manual labor idea. His efforts in promoting this idea in education was supplemented the following year, 1830, by the writings of W. C. Woodbridge, who published in the *American Annals of Education* his famous letters entitled "Sketches of Hofwyl," which described in detail the workings of the institution established by Fellenberg.

Up to 1829, the most successful manual labor "experiment," according to Rev. Cornelius, was the one at the Andover Theological Seminary at Andover, Massachusetts, and this one became "a model for other similar institutions." Originally the manual labor at Andover was "solely for the purpose of invigorating and preserving health, without any reference to pecuniary profit." (18—107) It was started in 1826 by "a few individuals in and out of the Seminary." In a short time it was considered so successful that the trustees

of the Seminary erected for its use a workshop 40 by 65 ft., three stories high. It was built of rough granite at a cost of nearly $3,000 and was equipped with benches and tools at an additional cost of $1,200. It would accommodate 75 workers at one time. The work done consisted of "making boxes of various kinds, such as type, soap, candle, hardware boxes, etc., also cabinet work, as bedsteads, tables, chests, etc." One and one-half hours each day were spent in the shopwork—"three quarters of an hour immediately before dinner, and the same length of time before supper, all working together." In addition to this, each one was allowed to work as much extra time as he chose, but no allowance on the regular time was made on account of this extra work. (18—108)

The manual labor shop was managed by an organization known as the Mechanical Association. In 1829, Rev. Cornelius said of it: "The earnings have been sufficient to defray the first cost of the materials manufactured, to purchase additional instruments, and to pay two professed mechanics whose joint wages have amounted to two dollars and thirty-four cents per day, besides leaving in the treasury at the close of the present term, between $200 and $300, to be divided among the members of the Association." (18—64)

At the end of three years the interest had not abated; favorable results were reported in the health of the members of the Association, which in turn, produced a good effect upon their scholarship.

While the manual labor at Andover was all mechanical and entirely voluntary, in many other schools it was largely agricultural and in the most successful schools it was compulsory. Moreover, while the movement gained headway in the early days largely through the influence of the theological seminaries, the first school to establish a manual labor system was not a theological school but an academy.

So far as can be determined from the facts that are available, the best example of the early schools in America to introduce a manual labor system of the Fellenberg type was the Maine Wesleyan Seminary which was founded in 1825 (19—I, 82), though the school at Gardiner, Maine, was opened in

1823 (cf. 86) and the one at Derby, Connecticut in 1824. (cf. 83) The Maine Wesleyan Seminary was a preparatory school or academy. The plan of the institution, which was to unite manual labor and study was worked out five years previous. The purpose was to help three classes of young men—(a) the "worthy poor" who wanted an education, (b) the idle well-to-do who needed proper motives to industry to keep them from dissipation, and (c) the especially talented students who "for want of some regular and systematic exercise, were doomed to find an early grave."

In connection with the seminary was a farm of 140 acres and a "mechanical shop" for "chair making, cabinet work, turning, sash making, and tool making." Coopering and shoemaking were tried but not found satisfactory. Shoemaking was considered "decidedly unfavorable to the health of those employed." (18—II, 110) One of the reports of the academy stated that 42 students paid their board and tuition *without labor;* 65 were in the "laboring department," 53 of which paid more or less of their board and tuition; and 12, by their industry paid all their expenses. (18—II, 111) A statement concerning the advantages of the plan is as follows:

> Here the scholar who is dependent upon his own exertions may obtain an education by spending a part of his time in labor, either in working on the farm, or in the mechanical department. And it has been satisfactorily ascertained that those who have thus spent a part of their time in labor, have been enabled to keep up with their class and their health has been much better than those who did not labor in this way. They have been able to pay their board and tuition, and have become acquainted with agriculture and the mechanical arts, while storing their minds with the knowledge and intelligence calculated to make them useful and intelligent citizens. (18—II, 63)

Two courses of instruction were offered: "One designed as preparatory for college, and the other intended to give a thorough English education, at the same time furnishing those who are willing to labor with a knowledge of agriculture or one of the mechanic arts." The courses were three years in length. (19—I, 82)

Another academy which became very famous—probably the most famous of any for its manual labor system, was the Oneida Institute of Science and Industry at Whitesborough,

near Utica, New York. This was opened to students in 1827, under the principalship of Rev. George W. Gale. Mr. Gale was one of the many ministers who had lost their health through too close application to study. He had retired to a small farm to recuperate, and in 1826, believing that vigorous exercise was the remedy for the evil from which he was suffering and desiring to try the experiment of using such exercise as a preventive measure as well as a remedy, he agreed to board and instruct eight young men in college preparatory work if they would labor for him in the field three and a half hours each day. He did not expect that their labor would be an adequate compensation for what he gave them, but he wanted to help them toward the ministry and to prove his theory of combining labor and study. The result of this experiment was highly satisfactory as regards students' health, their progress in their studies, and the volume of crops raised on the farm. (Source Material VI, B)

When the results of this experiment were laid before the Oneida Presbytery, steps were immediately taken to establish an academy which became the Oneida Institute of Science and Industry. A farm of 114 acres was purchased. The trustees of the Institute provided the farm fully equipped with stock, implements, etc., and the instructors were to have all they could make from the farm, using student labor from three to four hours a day. They were to board the students and to receive fifty cents a week for giving instruction. They must agree to return all property in as good condition as when they received it. The plan worked well the first year; there were 20 students and 40 acres were cultivated at a profit of $150. The second year, with 30 students and 50 acres under cultivation, the crops were nearly destroyed by a flood and the proceeds of the farm did not meet expenses. The third year, with the increase in the number of students to 40, it became necessary for the teachers to employ a farmer who boarded the students while the teachers gave most of their time to giving instruction.

Under the Oneida system, labor was required of every student. "Neither the amount nor the kind of labor was optional,

nor the time of performing it." Concerning the results, Mr. Gale reported that the system had been favorable to health, and concerning school work he said:

> I have no hesitation in saying that, as a general thing, I do not think that it has been impeded by the labor of the student, and in some cases, it has been promoted unquestionably. There are many cases, especially where young men have been accustomed to business, in which they feel the absolute need of this kind of exercise and they can study but little without it. And in no case will labor for three or four hours per day, if judiciously arranged, hinder the student in his literary progress. It ought, however, to be stated and regular. (18—114)

The Oneida Institute became so popular that 500 applicants were rejected during the year 1831, accommodations being available for only 60. (20—6)

Growing directly out of the experiences of the Oneida Institute, through the influence of Rev. John Monteith, the Manual Labor Academy of Pennsylvania, was established at Germantown near Philadelphia. Mr. Monteith visited Philadelphia in August, 1828, and described the Whitesborough experiences to the Pennsylvania brethren who were conscious of the "alarming destitution of laborers in the Gospel vineyard and the lamentably frequent instances of feeble health among them." (21—3) But, as the scheme appeared so novel, was "unsanctioned by the example of old institutions" and so "incompatible with a student's life," they were very skeptical about it. But finally, in October 1828, they adopted the plan, rented a place in Germantown for $350 a year, and opened the proposed academy the following May with four students under the Rev. John Monteith, who became its principal. (21—7) Within a year the number of students increased to 25, and the needs of the school grew so rapidly that the property, consisting of about forty acres of land and several buildings, was purchased. (21—8) The labor of the students consisted of carpentry, gardening, and farming. (19—I, 363) (Source Material VI, c) The school was evidently fortunate in having four students who were "good workmen in wood," who acted as instructors to the less experienced and were "profitable in their own labour." (21—9) These facts lead to the conclusion that the Germantown academy must have been the outstand-

ing institution among the early manual labor schools so far as instruction in woodwork is concerned. However, this was probably more by accident than by intent. In printed reports of early manual labor schools the emphasis is always upon the physical-exercise value of labor and upon labor as a means of earning board and academic schooling. Nothing is said about teaching woodwork by an expert woodworker, or teaching gardening by an expert gardener. The plea was "This health-preserving labour is also profitable." In this respect the Germantown school appears to have been forty years ahead of most of the manual labor schools.

Some of the institutions mentioned by Rev. Cornelius, in 1829, which had adopted or were about to adopt the manual labor system were: 1. Theological seminaries at (a) Auburn, N. Y., where a workshop and garden were available to students who wished to combine labor and study. (b) Maryville, Tennessee, where, by devoting one day a week to labor on the farm, a student might "defray the expense of his board in commons." (c) Danville, Kentucky, where two hours a day were spent in labor on the college farm a mile away. 2. Academies at (a) Andover, Mass. Phillips Academy was erecting a building where members "disposed to unite manual labor and study" might do so. They were to have an opportunity to "pay for their board entirely by means of their labor." (b) South Hadley, Mass. The Woodbridge School for boys in which provisions was made for manual labor "one to two hours a day in a workshop or garden." (18—234) (c) Cincinnati, Ohio. Lane Seminary, where every student was required "to labor daily, from three to four hours in some useful employment." (Source Material VI, D) 3. Colleges. Bowdoin in Maine and Middlebury in Vermont were reported as having erected workshops for associations of students, but the system had not then been put into operation.

Among the many other institutions adopting the manual labor system a little later were: (a) A school established on eighty acres of land on the Delaware River three miles above Wilmington by the Episcopal Education Society of Pennsylvania. The purpose of the school was to educate men for the

ministry. Four hours a day were given to manual labor. (22—13) (b) Waterville College, now Colby College in Maine, in 1830, built a workshop, chiefly by student labor, which was used by students in manufacturing "doors, blinds, sashes, bedsteads, tables, chairs, and boxes." The work was organized on the factory system, each student having his special process, as "sawing, planing, mortising, grinding tools, etc." A second and then a third shop were added. A printing shop, known as the "College Press" was a feature of the manual labor department. (23—282)

On the 15th of June, 1831, there was held in Masonic Hall, New York City, a meeting called to consider the introduction of "manual labor into literary institutions as a system of exercise for students." (20—3) At this meeting addresses were made by Rev. George W. Gale of the Oneida Institute, Rev. Rufus Anderson, secretary of the American Board of Commissioners for Foreign Missions, Rev. Edward Beecher, president of Illinois College, and others. Resolutions were passed on (a) the necessity of introducing a well-regulated system of exercise into all educational institutions; (b) the need of increasing the number of well-educated Christian ministers; (c) the desirability of introducing manual labor into schools and colleges, "as a means of promoting health, diminishing the expenses of an education, and cultivating all those qualities in a minister of the Gospel which the nature of his office requires and the exigencies of the present age loudly demand"; and (d) the appointment of a committee to consider the whole subject and take such measures as they considered best to promote the establishment of manual labor institutions throughout the country. (20—3)

The committee thus appointed called another meeting in New York the following month, July 1831, when the "Society for Promoting Manual Labor in Literary Institutions" was formed and action was taken appointing Theodore D. Weld of the Oneida Institute as the general agent of the Society. (24—507) The letter of instructions given to Mr. Weld stated that the general object of the Society was to collect and diffuse information concerning the best methods of "uniting labor

with study" in seminaries of learning. It admitted that the subject was but partially understood and that much of it rested in many minds "only as a pleasing theory." What the public wanted was facts from which principles might be deduced and rules of successful administration formulated. (19—II, 93) "In accordance with his instructions Mr. Weld visited most of the large towns and leading literary institutions in Ohio, Illinois, Missouri, Kentucky, Tennessee, and Alabama, prosecuting his inquiries and calling public attention to the manual labor system by public lectures and private conferences with the managers of the institutions he visited. Wherever he went he was well received, and his labors resulted in a great increase in public interest in bodily exercise in general and manual labor in particular." (24—508) In his report made to the Society in January 1832, Mr. Weld stated that he had travelled 4575 miles—2630 in public conveyances, 1800 on horseback, and 145 on foot. He had made 236 public addresses, 110 of which were on manual labor. He had written 282 letters and received a larger number. (25—10) While this report was well received and highly praised by many, it did not contain all the facts that Mr. Weld intended to present. It did not even include all he collected, owing to a serious accident. While trying to cross a flooded stream in a stage coach near Columbus, Ohio, he was thrown into the water, losing all his records and barely escaping with his life.

As his report could not contain the statistical facts desired, Mr. Weld did the best he could with the opinions he had obtained through correspondence and otherwise, and organized them in a very ingenious way to back up his own arguments in favor of the manual labor system of exercise. His report opens with a plea for physical training in educational institutions—the training of the mind and body to reciprocal action. Next, by quoting from numerous educators and physicians, he shows that the lack of physical training is the great defect of the educational system of that time. Then he sets forth, in elaborate manner, his claim that the manual labor system, properly carried out, will remedy this defect. Finally, he discusses the

difficulties in the way of success with the manual labor system and the way to avoid them.

His propositions concerning the great defect in education are:

(1) The present system of education makes fearful havoc of health and life; (2) it effeminates the mind; (3) it is perilous to morals; (4) it produces indisposition to effort and destroys habits of activity and industry; (5) it is so expensive that its practical effects are anti-republican.

Then follow his statements favoring the manual labor system:

(1) The manual labor system furnishes exercise natural to man. (2) It furnishes exercise adapted to interest the mind. (3) Its moral effect would be peculiarly happy. (4) It would furnish the student with important practical acquisitions. (5) It would promote habits of industry. (6) It would promote independence of character. (7) It would promote originality. (8) It is adapted to render permanent all the manlier features of character. (9) It would afford facilities to the student in acquiring a knowledge of human nature. (10) It would greatly diminish the expense of education. (11) It would increase the wealth of the country. (12) It would tend to do away with those absurd distinctions in society which make the occupation of an individual the standard of his worth. (13) It would have a tendency to render permanent our republican institutions. (25—56–64) (24—509)

Among the difficulties in the way of success he found:

(1) Misconception of the main design of the system. Some suppose its main object is to diminish the expense of education. Consequently, if three hours of labor a day are not found sufficient to defray the expenses of the student the system is of no value. (2) Misjudgement in the kind of labor selected. It is a mistake to furnish only those kinds of mechanical labor which require long practice for the acquisition of adequate skill. It should be remembered that it is not the aim of the manual labor system to make students finished mechanics and scientific agriculturists. (3) Inefficiency on the part of those who manage such institutions. (4) A want of active co-operation on the part of teachers. (5) Leaving labor to be regulated by the caprice of the student, rather than making it a requisition. Those manual labor schools where the individual is permitted to labor or lounge as he pleases, create undesirable and invidious distinctions among the students. (6) Promiscuous admission of students. To admit every applicant and thus form a motley assemblage, made up of every variety of age, habits, and character is the height of folly. (7) Adequate financial means for unembarrassed operation are necessary.

In a footnote Mr. Weld stated that many of the manual labor schools were "suffering beyond measure" for want of "workshops, and other buildings, implements of labor, land, stock,

apparatus, libraries, etc." From his statements it is clear that he foresaw the financial failure of many of the manual labor schools. It is also clear that he considered that one of the reasons for these failures would be that instead of making donations, many persons had invested their money in these schools expecting it to return to them an annual percentage from the profits of the student labor. (25—93–98)

"The preparation of this report," says Dr. Boykin, "was the last official act of Mr. Weld as general agent of the society, for at the end of his term of one year he resigned and entered a western institution to pursue his professional studies. His place was never filled, and the society for Promoting Manual Labor in Literary Institutions seems to have done very little if anything in the way of active work afterwards.

"The popularity of the subject was of only temporary duration, for the objections and obstacles which were easily disposed of on paper by Mr. Weld loomed up to formidable dimensions after a few years' experience. One by one nearly all the institutions in which manual labor had been tested found the idea unsatisfactory in practical operation and dropped it." (24—509)

Reasons for the decline of this movement were given by Mr. Weld in a letter written to Henry Barnard (1811–1900) in 1865. He said:

> I have modified in some respects my opinions as expressed in the report, and especially as to the amount of pecuniary profit to be expected from the manual-labor system even under the most favorable conditions. The practical difficulty in successfully combining labor and study in an institution also seems to me greater and more complicated. Labor, whether agricultural or mechanical, in order to be pecuniarily profitable to any considerable extent must be more continuous than would be consistent with the best conditions of study. So also the pecuniary results conflict with the best physical and mental. To secure the best result to body and mind, the students' three hours' exercise daily should be divided into half a dozen portions. This with the requisite changes of dress would be impracticable. So too, the exercise should be more diversified than is practicable. From the different kinds of labor such a selection should be made as will mete out to every part of the system that exercise which will best minister to its need. To do this effectually would require more frequent changes in the kind of work than could consist with much pecuniary profit. (24—510)

SOURCE MATERIAL VI, A

Vehrli's Normal School at Kreuitzlingen

From *The Social Condition and Education of the People in England and Europe* by Joseph Kay, Esq., M.A.

(*a*) *Account written by Sir James P. Kay Shuttleworth in 1841*

The normal school at Kreuitzlingen is in the summer palace of the former abbot of the convent of that name, on the shore of the lake of Constance, about one mile from the gate of the city. The pupils are sent thither from the several communes of the canton, to be trained three years by Vehrli, before they take charge of the communal schools. Their expenses are borne partly by the commune, and partly by the council of the canton. We found ninety young men apparently from 18 to 24 or 26 years of age, in the school. Vehrli welcomed us with a frankness and simplicity which at once won our confidence. We joined him at his frugal meal. He pointed to the viands, which were coarse, and said, "I am a peasant's son. I wish to be no other than I am,—the teacher of the sons of the peasantry. You are welcome to my meal; it is coarse and homely, but it is offered cordially."

We sat down with him. "These potatoes," he said, "are our own. We won them from the earth, and therefore we need no dainties; for our appetite is gained by labour, and the fruit of our toil is always savoury." This introduced the subject of industry. He told us that all the pupils of the normal school laboured daily some hours in a garden of several acres, attached to the house, and that they performed all the domestic duty of the household. When we walked out with Vehrli, we found some in the garden digging, and carrying on other garden operations, with great assiduity. Others were sawing wood into logs and chipping it into billets in the court-yard. Some brought in sacks of potatoes on their backs, or baskets of recently-gathered vegetables. Others laboured in the domestic duties of the household.

After a while the bell rang, and immediately their outdoor labours terminated, and they returned in an orderly manner, with all their implements, to the court-yard, where having deposited them, thrown off their frocks, and washed, they re-assembled in their respective class-rooms.

We soon followed them. Here we listened to lessons in mathematics, proving that they were well grounded in the elementary parts of that science. We saw them drawing from models, with considerable skill and precision, and heard them instructed in the laws of perspective. We listened to a lecture on the code of the canton, and to instruction in the geography of Europe. We were informed, that their instruction extended to the language of the canton, its construction and grammar; history, and especially the history of Switzerland; arithmetic; mensuration; such a knowledge of natural philosophy and mechanics, as might enable them to explain the chief phenomena of nature and the mechanical forces; and some acquaintance with astronomy. They had continual lessons in pedagogy, or the theory of the art of teaching, which they practised in the neighbouring village school. We were assured, that their instruction in the Holy Scriptures, and other religious knowledge, was a constant subject of solicitude.

The following extract from Vehrli's address at the first examination of the pupils, in 1837, will best explain the spirit, that governs the seminary, and the attention paid there to what we believe has been too often neglected in this country—the education of the heart and feelings, as distinct from the cultivation of the intellect. It may appear strange to English habits to assign so prominent a place in an educational institution to the following points; but the indication here given *of the superior care bestowed in the formation of the character, to what is given to the acquisition of knowledge*, forms in our view the chief charm and merit in this and several other Swiss seminaries, and is what we have laboured to impress on the institution we have founded.

To those who can enter into its spirit, the following extract will not appear tinctured with too sanguine views:—

"The course of life in this seminary is threefold:

"1st. Life in the home circle, or family life;

"2nd. Life in the school-room;

"3rd. Life beyond the walls in the cultivation of the soil.

"I place the family life first, for here the truest education is imparted; here the future teacher can best receive that cultivation of the character and feelings, which will fit him to direct those, who are entrusted to his care, in the ways of piety and truth.

"A well-arranged family circle is the place, where each member, by participating in the other's joys and sorrows, pleasures and misfortunes, by teaching, advice, consolation, and example, is inspired with sentiments of single-mindedness, of charity, of mutual confidence, of noble thoughts, of high feelings, and of virtue.

"In such a circle can a true religious sense take the firmest and the deepest root. Here it is that the principles of Christian feeling can best be laid, where opportunity is continually given for the exercise of affection and charity, which are the first virtues that should distinguish a teacher's mind. Here it is that kindness and earnestness can most surely form the young members to be good and intelligent men, and that each is most willing to learn and receive an impress from his fellow. He who is brought up in such a circle, who thus recognises all his fellow-men as brothers, serves them with willingness whenever he can, treats all his race as one family, and loves them, and God their Father above all, how richly does such an one scatter blessings around! What earnestness does he show in all his doings and conduct! What devotion especially does he display in the business of a teacher! How differently from him does that master enter and leave his school, whose feelings are dead to a sense of piety, and whose heart never beats in unison with the joys of family life!

"Where is such a teacher as I have described most pleasantly occupied? In his school amongst his children, with them in the house of God, or in the family circle, and wherever he can be giving and receiving instruction. A great man has expressed, perhaps too strongly, "I never wish to see a teacher who cannot sing." With more reason I would maintain, that a teacher to whom a sense of the pleasures of a well-arranged family is wanting, and who fails to recognise in it a well-grounded religious influence, should never enter a school room."

As we returned from the garden with the pupils, on the evening of the first day, we stood for a few minutes with Vehrli in the court-yard by the shore of the lake. The pupils had ascended into the class-rooms, and the evening being tranquil and warm, the windows were thrown up, and we shortly afterwards heard them sing in excellent harmony. As soon as this song had ceased, we sent a message to request another, with which we had become familiar in our visits to the Swiss schools; and thus in succession we called for song after song of Nägeli, imagining that we were only directing them in their usual hour of instruction in vocal music. There was a great charm in this simple but excellent harmony. When we had listened nearly an hour, Vehrli invited us to ascend into the room, where the pupils were assembled. We followed him, and on entering the apartment, great was our surprise to discover the whole school, during the period we had listened, *had been cheering with songs their evening employment of peeling potatoes, and cutting the stalks from the green vegetables and beans, which they had gathered in the garden.* As we stood there, they renewed their choruses till prayers were announced. Supper had been previously taken. After prayers, Vehrli, walking about the apartment, conversed with them familiarly on the occurrences of the day, mingling with his conversation such friendly admonition as sprung from the incidents, and lifting his hands he recommended them to the protection of Heaven, and dismissed them to rest.

We spent two days with great interest in this establishment. Vehrli had ever on his lips,—"We are peasants' sons. We would not be ignorant of our duties but God forbid that knowledge should make us despise the simplicity of our lives. The earth is our mother, and we gather our food from her breast; but while we peasants labour for our daily food, we may learn many lessons from our mother earth. There is no knowledge in books like an immediate converse with Nature, and those that dig the soil have nearest communion with her. Believe me, or believe me not, this is the thought that can make a peasant's life sweet, and his toil a luxury. I know it; for see my hands are horny with toil. The lot of man is very equal, and wisdom consists in the discovery of the truth, that what is *without* is not the source of sorrow, but that which is within. A peasant may be happier than a prince, if his conscience be pure before God, and he learn not only contentment, but joy, in the life of labour, which is to prepare him for the life of heaven."

This was the theme always on Vehrli's lips. Expressed with more or less perspicuity, his main thought seemed to be that poverty, rightly understood, was no misfortune. He regarded it as a sphere of human exertion and human trial, preparatory to the change of existence, but offering its own sources of enjoyment as abundantly as any other. "We are all equal," he said, "before God; why should the son of a peasant envy a prince, or the lily an oak: are they not both God's creatures?"

We were greatly charmed in this school by the union of comparatively high intellectual attainments among the scholars, with the utmost simplicity of life, and cheerfulness in the most menial labour. Their food was of the coarsest character, consisting chiefly of vegetables, soups, and very brown bread. They rose between four and five, took three meals in the day, the last about six, and retired to rest at nine. They seemed happy in their lot.

Some of the other normal schools in Switzerland are remarkable for the

same simplicity in their domestic arrangements, though the students exceed, in their intellectual attainments, all notions prevalent in England of what should be taught in such schools. Thus, in the normal school of the canton of Berne the pupils worked in the fields during eight hours of the day, and spent the rest in intellectual labour. They were clad in the coarsest dresses of the peasantry, wore wooden shoes, and were without stockings. Their intellectual attainments, however, would have enabled them to put to shame the masters of most of our best elementary schools.

Such men, we feel assured, would go forth *cheerfully* to their humble village homes to spread the doctrine, which Vehrli taught of peace and contentment in virtuous exertion; and men similarly trained appeared to us best fitted for the labour of reclaiming the pauper youth of England to the virtues, and restoring them to the happiness, of her best instructed peasantry. (10—375–381)

(*b*) *Account by Joseph Kay published in 1850.*

The best and most practically efficient colleges, that I saw in Switzerland, were, the one conducted by Vehrli at Kreuitzlingen on the borders of the lake of Constance, and about a mile from the gate of the city of Constance, and the college of the canton of Berne, situated close to Hofwyl.

To this latter one I paid a visit in company with M. de Fellenberg, the son of the celebrated educationalist. It is a large roomy building, with a good farm attached to it, and is situated in a beautiful, undulating part of the country, which is here covered with vast pine forests, and bounded by the magnificent and lofty chain of the Bernese Alps, conspicuous among which rises the snowy mass of the majestic Jungfrau. In the midst of this splendid scenery, the young candidates for the teachers' profession, selected from among the monitors of the schools of the Bernese towns and villages, are educated for three years, in a manner, which in England would fit them to be tutors to the children of our nobility, but which, in Switzerland, combined with the healthy discipline under which they live while in the college, prepares them to act, as the teachers of the children of the poorest, as well as of the richest citizens. When I visited the college with M. de Fellenberg, the young men, 100 in number, were in their class-rooms, listening to the lectures of the professors. As I entered the college, the first thing which met my eye, was the collection of spades, hoes, etc., belonging to the students. Each student has his own field tools, and his own peg on which to hang them; while near them were placed the thick wooden clogs used in the fields, but left with the tools, when the young men entered the lecture rooms. Everything in the college was plain, simple, and perfectly unostentatious, but clean and substantial.

The education given in the class-rooms was of the most liberal and efficient character. There is no attempt in Switzerland to disguise the feeling, which is impressed on the minds of all, that they are a Republic,—that the people are the electors of the rulers,—that the electors must be enlightened, in order that they may be able to exercise their liberties aright, and to make the best use of their resources,—and that the teachers to whom the great duty of educating the citizens is entrusted, must be thoroughly efficient, strong minded and learned men; capable of unfolding the principles of others, and of teaching sound and true maxims of self-government and of political econ-

omy. An Englishman, accustomed to his country's ideas of the teachers' profession would indeed be astonished, could he observe what an education the teachers receive in Switzerland, Germany, and Holland. The student comes to the normal college much better educated than the vast majority of our teachers are, when they commence the management of schools. During the three years the Swiss teachers remain in the college, they receive daily instruction from learned men in history, physical and local geography, mathematics, practical science, music, drawing, pedagogy, and agriculture. How much superior such men are, when they leave the college, to the majority of our teachers, I leave my readers to imagine.

There are 100 students in this normal college; about 33 leave it every year to take the charge of primary schools in the canton. The government has, therefore, established two other normal colleges, one for the education of school-masters, and the other for the education of school-mistresses. In all three of these colleges, Romanist and Protestant students are educated together, although the directors are Presbyterian ministers. The Romanist students are allowed to absent themselves during the religious lectures, and receive religious instruction from one of their own priests.

The population of the canton of Berne in 1843 was 407,913, and there were more normal colleges provided for this small population than for that of London, which is nearly five times as numerous!

I went through the lecture-rooms of the Berne college in company with the director and M. de Fellenberg. I found the different classes of the students sitting in their separate lecture-rooms at their desks, receiving a much more liberal and efficient education from the professors of the college, than the majority of the sons of our gentry ever enjoy.

The students were very plainly but neatly dressed. They had exchanged the clogs which they used in the fields for light shoes. They had left their field dresses with their tools in the places set apart for them. They had washed and cleaned themselves after their out-door labour, and set at their work,—as fine, healthy, and intelligent looking a set of young men as any one could have wished to see; attentive and respectful to their tutors, but inspired with that feeling of self-confidence, which the union of intelligence, health, and political freedom invariably bestows. In looking at them, one felt that the teaching of such men must lay a sound foundation whereon to build the prosperity, manly virtue, and happiness of a nation. Men trained in such a manner as this feel a real pleasure in labour, understand the habits and feelings of peasants, sympathise with them, associate with them without restraint and embarrassment, and, without lowering themselves, make the peasants feel that their own class is capable of being as refined as the richest classes in the community, and of joining to that refinement a masculine simplicity and energy of character, which their own particular sphere of life is better qualified than any other to foster and develop.

But the most interesting of all the Swiss teachers' colleges is that directed by Vehrli. About a mile from the gates of the old city of Constance, close to the shore of the vast and beautiful lake of the same name, and upon a rising ground which slants gradually upwards from the water, stands an old-fashioned looking building, in the style which the nobles of Germany were so fond of about three hundred years ago. This ancient, turreted house was

formerly the palace of the abbot of the vast convent situated about half-a-mile distant, and still occupied by monks. On all sides it commands magnificent views. Close below it, and spread out seventy miles in length, and twenty miles in breadth, lies the beautiful lake of Constance. To the left, at about a mile distant, rise the ancient, time-honoured towers of the council and martyr famed city, stretching out the white stone pier of its harbour into the blue waters of this inland sea. Far to the right, are seen above the sea the lofty, snow-clad peaks of the mountains of Appenzell. In front, appear just above the horizon, the forest-covered hills of the kingdom of Würtemberg. Behind, rises the great mass of the convent, and round the palace, lies its well-cultivated and fertile farm. This commodious and beautifully situated building has been set apart by the republican government of the canton of Thurgovie for the teachers' college, and to become its director, Vehrli was tempted to leave De Fellenberg, whose comrade and assistant he had to that time been.

I visited Vehrli several times. The first time I walked to the college, Vehrli was on his fields superintending some field labour. One of the students, however, was in the hall, and promised to go and tell the director I wished to see him, begging me to enter and look at anything I wished to see while he was absent. I accepted the invitation and walked through the bedrooms and class-rooms. Every part of the furniture of the college was of the plainest and most unostentatious kind. The bed-linen was coarse, the chairs and tables simple deal; but the books in the class-rooms, the diagrams of the last mathematical lessons chalked upon the blackboards, the drawings of the students, and the music books, served to show the visitor, that he was in a college, where the instruction given to the students formed a strange contrast to the simplicity of their domestic life.

In a short time, Vehrli made his appearance. He was dressed in a coarse tweed coat, an old weather-worn hat, and thick farming shoes, his hands and face were brown like those of a peasant; but his bright eye and strong marked features told me, that he was a man of practical ability and of action, and no mere theoriser on the improvement of mankind.

When I next visited him he was busily engaged with the students in repairing the wooden furniture of the college, and the handles, etc., of his farming tools.

Almost his first words to me were, "You must not expect to find any grandeur in my house; my boys are all to be engaged among peasants, to live among them, to associate with them, to advise them, and to be their friends and the instructors of their children. It is a difficult thing for an educated man to do this, unless his habits are properly disciplined during the period of this education; and the object of my labours is, so to discipline my students, that they may be able to do all this, when they are learned men.

"It is necessary, that teachers of the poor should learn and should be accustomed to labour; for labour gives humility, and teaches how to respect the labourer.

"After a long experience in teaching both the children of rich and poor, it is my firm opinion, that all children should be accustomed, while they are young, to labour with their own hands for a certain time every day. No school ought ever to be situated in a town. All ought to be situated in the

country; and every boy, no matter who his parents are, ought to be obliged to labour upon the soil. Labour makes the children healthy, capable of bearing fatigue and robust, and it teaches the children of the rich to get rid of all those notions which riches are too apt to stimulate; to understand the feelings of the poor better; to treat them better, and to associate with them better; it thus diminishes the artificial distance between classes, and, with the distinction of this artificial distance, it diminishes also the jealous feelings which false mannerism on the part of the rich too often engenders.

"But important as labour is in my own opinion, as a part of the training of *all* youth, it is absolutely necessary in the education of teachers of the poor.

"The object of a normal college is to train men, who will be capable of educating the poor, i.e., of teaching them the doctrines of religion, the laws of morality, a knowledge of letters, the principles of the sciences, how to make the most of their opportunities, what is expedient in their different careers of life, the great importance of prudence and foresight, if they would improve their positions in the world and attain independence, and the intimate dependence of all classes of society upon each other. To enable us to give such an education as this to the poor, we must rear a class of teachers, who will be at once the instructors, the friends, and the associates of the poor. How can we attain this end?

"Will it be sufficient to give a good education to the young men, to educate them in a gentlemanly and luxurious manner, and surrounded by many of the elegancies and comforts by which the middle classes are surrounded? Should we train them for years together in large and comfortable colleges, with great rooms, and in good clothes, as the children of the rich are educated? Is there anything in the life of a teacher in a poor, remote village, separated from all literary society, which is at all similar to the life of such a student, or which would enable the teacher of the village to gratify the tastes acquired in such a college? If there is not, ought we to be astonished, if a young man, who has left such a college and entered into the village school and upon his arduous school duties, should be dissatisfied with the change, and should begin first to wish and then to strive to get another situation, more suitable to the habits he had acquired in the college? This is the reasonable, and almost inevitable result of such an education. The money which any government spends in educating the teachers of the poor in such a manner, will be generally found in the end to have been expended in educating a good clerk of some merchant's house, while the schools will be deserted and will want teachers.

"You must, if you wish to avoid these consequences, make the student's college life as simple, and even more humble and laborious, than the teacher's village life. You must accustom the teacher to a peasant's life and to a peasant's hardships. You must make his college life a life of greater drudgery than his village life, and then, however highly you instruct him, however learned you make him, he will, when he settles down in his village, find his life one of less toil, of greater ease, and of more enjoyment, than that to which he had been for three years accustomed in his college.

"I think that every normal college ought to be situated in the country, and that it ought to have a piece of land attached to it, of sufficient size to employ the young men four hours every day in cultivating it. The farm

attached to my college is large enough to do this, and I find, that by cultivating the vegetables necessary for our household, and by selling all, that we do not require for our own use, I can diminish what would otherwise be the annual expense of our household, by one-fifth; so that the out-door labour, besides rendering the education of the college more efficient in a moral point of view, saves the government of our canton a considerable annual expenditure in the sustenance of the college itself; and by making the teachers satisfied with their situations in the villages, lessens the number of annual vacancies in the teachers' situations, occasioned in other cantons by the teachers' dissatisfaction with their duties, and, consequently, lessens materially, the number of new teachers, and, therefore, the number of students, who would otherwise be annually educated in the colleges to supply those vacancies.

"The chambers, the repasts, all the comforts and the manners of life in the college ought to be inferior, and not superior, to those which the teacher will enjoy afterwards in his village life.

"In our college, our students do every thing for themselves. They clean their own chambers, brush their own boots, clean the knives and forks, cultivate all the vegetables, prepare them to be cooked, and set out the meals. But notwithstanding all this, they work in their class-rooms eight hours every day, and study the Scriptures, history, geography, arithmetic, mathematics, the elements of the sciences, music, and drawing."

The students, before they enter this admirable college, have received an excellent education in the primary and secondary schools of the canton. They remain two years, however, in the college, before they are entrusted with the management of any school.

Vehrli said, "The students ought to remain four, or at least three years in the college; it is impossible to form good habits in a shorter period. But our government has not thought it necessary to allow me to keep my students more than two years.

"I have heard that in England you do not give the greater part of your teachers any special education whatever; but that you advertise for a teacher, and choose the best of all the candidates who apply. Your countrymen will act very differently in a few years. It is strange, that so great a people as the English, should have done so little for the education of their poor, especially considering how much poverty there is in England; but I suppose it is the jealousy of your religious parties, which has hindered you thus far. Here, in Switzerland and Germany, we are firmly persuaded, after much experience, that no one can officiate well as teacher, unless he has been educated specially and for a long time in the particular knowledge, habits, and manners, which a teacher must possess, in order to fit him for the proper performance of his duties. The education of the young is a very delicate and difficult work. It is a fatal error to imagine, that *any* one is fit for it, without preparation."

I walked over the farm with Vehrli, saw his young men at work in the fields, and spent a considerable time with the students, while Vehrli himself was engaged with other people. I was very much pleased with the manners of the young men. They were gentlemanly, but quite unaffected in their way of addressing any one. They spoke with pleasure of their work, with affection of the director, and with a tone of healthy feeling about every thing,

which showed me, that the wholesome discipline of the college was producing its proper effect upon them. They were fine, healthy, active-looking fellows, capable of bearing fatigue, and accustomed to simple and self-denying habits.

Vehrli said to me, "Go amongst my boys alone, and talk to them, and ask them whatever you please. See every thing for yourself." I did so, and the more I saw, the more I was convinced that the college was no mere show-place, but that it had been established for an end, which it was carrying out. . . .

We afterwards walked into the country to see two *agricultural schools*, one of which was then in the course of erection. These agricultural schools are institutions intended for the completion of the education of the sons of farmers, after they have left the primary schools. The scholars receive an excellent education in the science of agriculture, as well as in chemistry, mathematics, history, geography, and the languages. A large farm is attached to each of these institutions, well stocked with cattle, farming implements, etc., where the boys learn farming for five or six hours every day, under the direction of an experienced farmer. The produce of these farms enables the institutions, I believe, to support themselves without assistance, and to afford the board and education at so low a rate, as to bring it within the reach of the poorest farmers. A great many of these institutions have been established throughout Switzerland. They are improving the system of farming more than anything else that could have been devised; and for a country of small farms like Switzerland, they are of inestimable importance. I found that nearly all the cantons either had established, or were thinking of establishing, such schools. In these institutions, the farmers get a very cheap and scientific education for their children, while by their means the country gets better farmers, and much more scientific and economical farming. If we except Saxony, there is no country in Europe, where the farming is so good; and where all the means of cultivation are so carefully made use of, as in the Protestant cantons of Switzerland. This is entirely owing to two causes—the subdivision of the land among the peasants themselves, and the excellent education which the farmers receive.

Vehrli spoke very highly of these agricultural schools, and of their results. He seemed very anxious to increase their numbers, and told me that they were about to found a very large one, as a model for all the others, and as a monument in honour of the first great teacher of Switzerland—Pestalozzi.

M. de Fellenberg also took me to see an agricultural school, he had founded near his great institution, and assured me that the importance and usefulness of these schools for farmers could not be over-estimated. The young students learn chemistry and agricultural chemistry—how to treat different kinds of soils—how to make good manures—how to collect and employ all the waste of the farms in the making of manure—how to drain the farm-yards—how to manage sickly cattle—how to drain the fields, and how to avoid waste in every part of the farming operations.

The consequence is, as I have before said, that the farming operations in Switzerland give a greater return in proportion to the outlay, than those of almost any other country in Europe. On a Swiss farm nothing is wasted. Everything that can be converted into manure, such as the drainings of the yards, stables, cow-houses, kitchens, offices, etc., is collected and spread over

the fields, after having been prepared in such a manner, as to suit the particular character of the soil of each farm. No room is lost in the arrangements of the fields and plots of land. No stones or rubbish are left upon the land to injure the crops. The soil is cleaned as well as if it were garden land. It is always well drained, and is never injured by a too frequent repetition of the same kind of crops.

The cattle too are well tended. Their ailments are understood, and the kind of treatment proper for their cure. A richer milk and butter are thus obtained, as well as more of them; and, as I have before said, a given amount of capital expended in farming produces much more in Switzerland than in England, because there is less waste in the farming operations of Switzerland than there is in those of England; because the farmers of Switzerland are much better educated, and understand farming much better, than the farmers of England; and last, but not least, because the farmers of Switzerland are proprietors of their own farms, and much more interested in the good cultivation of their own estates, than the farmers of England, who cultivate the land of another and do not know how long they will remain in possession of the farms, which are let to them.

I was very much interested in all I saw and heard whilst with Vehrli. He is a man, who has perhaps had more experience in educating the children of peasants than any other person in Europe. He has, for forty years, watched the progress and effects of education in Switzerland. He has been a general referee and adviser. People have visited him from all parts of Europe to consult him on systems and methods; to see his college; to ask his opinions, and to tell him of the progress and effects of national education in their own districts. He is therefore of all men in Europe, perhaps the best qualified to express an opinion, both on the effects to be expected from education, and upon the way in which that education ought to be given.

He expressed himself positively and decidedly on the effects, which education was producing in Switzerland. He said that pauperism was diminishing; that the prudential habits of the people were rapidly improving; that their tastes were rising; that they were beginning to dress better and better; to build better houses; to furnish them better; to lay by more against bad times; and, in a word, to become more intelligent, civilised, independent, and happy. He said his decided opinion, based upon wide experience, was, that the more intelligent a people were, the more prosperous and virtuous they would inevitably be.

But he also said to me over and over again: "You cannot educate your peasants, unless you educate your teachers first. To make a good teacher requires a very careful, long, and special education. A bad teacher or a stupid teacher does much more harm than good. It is very incomprehensible to us here, that you English, with your enormous pauperism, should have done so little for the education of your poor, while Germany, Switzerland, France, and Holland have been making such great efforts, and with such very satisfactory results. Teach the people to think and they will take care of themselves, and will not require to be supported by your charity. (10—II, 359–374)

SOURCE MATERIAL VI, B

Origin and Management of Oneida Institute of Science and Industry

By Rev. George W. Gale, Principal
From *Quarterly Register and Journal* of the
American Education Society, 1829

As I had suffered almost the entire wreck of my constitution and health from the same system that has destroyed so many of your beneficiaries, and which this is designed to remedy, and being on a little farm in the town of Western, in this county, for the benefit of my health it was thought best that I should make the experiment. I accordingly offered eight indigent young men their board, washing and lodging, if they would engage to labour three and a half hours per day. I did not expect their labour would be a compensation, but I wished to hold out to them such inducements as would dispose them to engage with alacrity in the business. As plain living was to be a part of the plan, I was satisfied, although many thought otherwise, that I should not lose much, except my time and labour, for which I expected a full remuneration in the pleasure which I should derive. The event justified my expectations. After gathering the fruits of our labour in the fall we had, from 14 acres of land, and a kitchen garden 350 bush. of sound corn, about 70 bush. of oats and peas, and about the same quantity of potatoes, 15 bush. of onions and other kinds of vegetables in abundance for the family. In addition to this, there were cut and drawn to my door, from a lot about 1 mile distant, 25 cords of wood. One of the students being in poor health when he came soon left. Another, who was a tailor by trade, pursued his business in the shop for the most part, so that I had only six labourers; and these it was judged, in the fall, had not laboured upon an average more than 3 hours per day. They were with me about 8 months. In the latter part of the succeeding winter, the plan was laid before the Oneida Presbytery, and received their unanimous approbation; and steps were immediately taken for the establishment of this Academy. After several meetings of gentlemen favourable to the enterprise in Utica, a constitution was adopted. Mr. Frost and myself were appointed agents to collect subscriptions and donations. About $2,000 were soon raised, and the farm now occupied, containing 114 acres was purchased for $5,358 and teachers were appointed, who entered upon their labours about the first of May, 1827. It may not be improper to state here the terms upon which the teachers engaged in their duties, as this continues to be the plan and as it may serve to explain other remarks, that may be made, and answer the question which has often been asked, "How are the teachers supported?" The farm is furnished by the Trustees with every thing necessary for conducting it;—i.e., teams, stock, carts, waggons, and all the implements of husbandry, together with all the table and kitchen furniture, etc. The instructors are to have all they can make from the farm, and be responsible for all committed to them, and to return it, in as good condition as it was received. They are to board all the students they can employ for the labour, of not less than three, nor more than four hours per day, and to be paid fifty cents a week for instructing. The teachers run all the hazard of loss of every kind, provide a farmer and steward, gardener, etc., direct and govern the school, according to their own discretion, subject, however, to the inspection of the

Trustees, and to be removed at their pleasure. The first year there were about 20 students. More could not be received, for want of house room. Not far from 40 acres were cultivated in the ordinary way of farming. Board was provided in the family of one of the Teachers, and the farming directed by them with the aid of a day labourer. The proceeds of the farm exceeded the expenses by about $150, but provision was to be made for the coming year, so that the only compensation was the tuition money of 20 students, and the board of one of their families. The second year there were 30 students. This year about 50 acres were cultivated, with a considerable increase of gardening; I mean, by cultivation, the ploughing and sowing of the land. But this was a disastrous year to the farming concern. In consequence of the wetness of the season, and the overflowing of the river, half the crops were laid under water in August and nearly destroyed. The proceeds of the farm therefore did not this year meet the expenses. The Teachers *only*, however, suffered the loss. The want of a farmer and steward was deeply felt. The duties of the Institution, in consequence of the increase of students, were too numerous, and too complicated to admit of the Teachers' directing the farming concerns longer. Accordingly, the business of boarding and directing the farm was committed to a family, employed by the teachers. The farmer receives the land from them upon the same terms, that they receive it from the Trustees, except that the teachers are still responsible, and receive a portion of the proceeds of the farm to indemnify them. The farm being found upon experiment, to be better adapted to keeping stock than raising grain, it was thought best for a time to change the location; but as gardening is found to be more profitable than farming, and the sale of milk also a considerable source of profit, it has been concluded to retain the present location. The proceeds of the present year have convinced us that, in this place, we can eventually afford business to as many young men as it is best to have in one Institution. They can be boarded upon the same terms that they have been, without any loss to the teachers, and with a continual improvement of the farm. . . .

All kinds of labour usual upon a farm or garden have been performed during the season by the students, i.e., from the first of April until the last of November. In the winter, many of them have been employed in teaching school. We are now erecting a mechanic shop, 50 feet by 30, and as we are expecting to commence building early in the spring the Institution can furnish various kinds of business, such as planing boards, and making window-frames during the winter. This will serve as a good introduction to other business in future.

"The time spent daily in labour, about which you inquire in the fourth place, is upon an average three and a half hours per day. This is performed, during the summer months, one half before breakfast, and the rest before supper. In the Fall, before dinner instead of the morning, and the rest before supper. Some have thought it would be better to do all the work at once, and on many accounts it would, but in our opinion, it would not serve so well as a system of exercise for the students. The school is divided into classes for labour. These are directed by a monitor, chosen by the class, and nominated by the Teachers. The monitors receive orders from the farmer, direct the class, keep the time of each one's labour, and report delinquencies if there be any." (18—II, 112–114)

SOURCE MATERIAL VI, c

Labor and Study at the Manual Labor Academy of Pennsylvania

From First Annual Report of the Board of Trustees, November, 1829

The German town premises, in this manner have become the property of the association. They consist of 42½ acres of good land, several out-houses and a commodious dwelling on the main street, the residence of the late Dr. Blair. The farm is in the rear of the dwelling, opening on a lane which communicates with the main road: there is on it, stabling, coach house, granary, cart shed and farm yard. Between the farm and the front building there is a paled culinary garden of ⅓ of an acre. The rest of the ground contains the site of the dwelling, surrounding pavements, grass plats and a coach way which extends back into the farm and communicates with all the premises. The street lot is 150 feet front, the front edifice is of stone 42 by 36 ft., of three stories, with east and west back projections of two stories. To the East end is attached a chapel room, 38 by 16 ft. The 1st story consists of a central entry, 6 ft. wide, 4 rooms 16 ft. square, and 3 back apartments; the 2d story is similarly divided: the 3d consists of a front room, 38 ft. by 10 ft., and 3 back rooms: the garret is an unfinished apartment 40 ft. sq.

These premises are under the superintendence of the Principal, Rev. John Monteith, who with the Professor of Mathematics, Mr. William H. Burroughs and their families, dwell in them.

The youth under their care, have respectable talents, habitual industry, and are pleased with the mode of Education. The health of this interesting family has been uninterrupted except in a few cases where they were diseased when admitted. Every invalid remaining there has been restored to health. They board with the principal, their diet plain and in as great variety as is consistent with economy and health, and as much as possible, the products of the pupils' labours on the farm. Piety, learning and honest industry are here united. Surely such an enterprise cannot fail.

Nearly all the pupils study the languages, reading now Selectae Profanis, Greek reader, Viri Romae, Historia Sacra, and the grammars. A class is engaged in Geography, another in Geometry, and some in Algebra, Surveying and Bookkeeping. A large class spent a portion of their time in Arithmetic and Penmanship. All the classes are exercised in English reading, spelling, grammar, composition, declamation, disputation, Alexander's Evidences, and daily reading of the Sacred Scriptures. They attend public worship every Sabbath and make two recitations, memoriter and catechetically, in the Bible. Sacred vocal music is also to be introduced.

The hours of recreation are not hours of waste and idleness and immorality. They are employed in useful bodily labour. Such as will exercise their skill, make them dexterous, establish their health and strength, enable each one to defray his own expenses, and fit for the vicissitudes of life, particularly so, if they be destined for our new settlements, as Christian missionaries.

Thus far they have been employed in carpenter work, gardening and farming. Four of the *students* are *good workmen in wood;* profitable in their own labour and also as instructors to those who are less experienced. Six or seven thus employed have already made the various repairs of the buildings and

nearly *all* the *needful furniture.** Some orders from the city for small wooden articles have been executed by them and they are ready for more. Those who are engaged in gardening have supplied the house. Others will furnish from the farm 30 bushels of wheat, 70 bushels of rye, and 10 tons of hay, 150 bushels of corn, and 350 bushels of potatoes.

For manly hardihood, could Spartans be better educated? Were the Schools of the prophets founded on better principles? These modern students show that Manual Labour is full of blessings. Their blood flows warm and rich, and equable; and the east winds cannot penetrate them. Their thirst demands water, their hunger, plain food, their limbs rejoice in muscular efforts, and their minds, in Truth. Sleep rests them, and their waking eyes behold the early light of another cheerful, useful day. These are some of the blessings. And ought not the land of Christian Pilgrims have many such institutions? Few of these students comparatively will be sickly men, to be broken down under the duties and responsibilities of life. Cough, and seated pains, and depressed spirits, and inveterate headaches, etc., will not come upon them when they are toiling in the moral desolations of our country, to drive them from their useful stations. Nor will death be so premature. (21—8–10)

*The articles made by them are such as book cases, tables, bedsteads, benches, stools, knife and spoon boxes, doughtrays, pie boards and clothes frames, and a variety of similar articles which are usually made of pine, cherry, ash or oak, together with partitions and other repairs made on the house and appurtenances.

A square table with two drawers	$ 4.00
A cherry book case	10.00
A large cherry table	.....
A long study table	5.00
2 long dining tables at $3 each	6.00
5 good pine tables $2 each	10.00
4 inferior $1.50 each	6.00
5 maple bedsteads for sacking and with turned post $3	15.00
4 cots of maple $1.50	6.00
3 trundle bedsteads $3	9.00
7 long benches $1.50	10.50
4 shorter at $1.25	5.00
4 single do. 50c	2.00
2 plain book cases $6 and $4	10.00
1 large sink $2	2.00
2 doughtrays 75c	1.50
1 pie board	.20
1 large knife box	.60
1 spoon box	.40
2 knife boxes 70c and 50c	1.20
2 pair cherry stools $1.00	2.00
3 do. pine 80c	$ 2.40
7 clothes frames at $2.50	17.50
1 candle box	.50
1 wash bench	2.00
2 pair wagon shafts $1.75	3.50
1 large meal chest	4.00
Repairing cart	4.00
1 wheelbarrow without wheel	3.50
1 saw frame	.50
Putting on 2800 laths	3.50
3 flails	.60
Work in repairing the garret, and kitchen, lecture room, gates, doors, shops, windows, several partitions, 4 work benches, etc. about 30 days	30.00
Repairing and varnishing articles of furniture	4.00
A black board	1.00
A fire board	1.00
	$154.00

SOURCE MATERIAL VI, D

A Manual Labor Department of an Academy

From *Lectures on Education* by George Brewster, Principal of Cleveland Academy, 1833

At the rear of the main edifice, and perhaps at the termination of the Academic grounds, a long wooden building parallel with the main edifice should be constructed two stories high, and sufficiently large for the accommodation of three classes at a time, or three or four hundred students. Per-

haps an edifice one hundred feet long, and twenty feet wide, would be large enough for their accommodation. On each side of this edifice, from end to end of the two stories there should be constructed suitable work benches for the accommodation of the young artisans, and suitable tools should be furnished. In this Mechanical department, various kinds of work should be operated; such as plain joiner's and carpenter's work, cabinet work, carved work, chair making, *et cetera;* by which labor each student, after he has arrived at sufficient age, shall be able to earn something towards defraying the expenses of his Academic course. Each of the ten highest classes should be daily engaged in this labor for a certain allotted portion of time, in the following manner, and after the following order: At seven o'clock in the morning, all the students belonging to the Academic family should invariably breakfast. At eight o'clock, all the students belonging to the Academic department should repair to their several departments at the ringing of the bell. Being called to order by their professors, the third, fourth, and fifth classes should make preparation to repair to the Mechanical department, each class headed and superintended by its respective professor, who shall have been himself qualified for a master artisan of his class by a previous apprenticeship. There those three classes should be required to labor steadily and industriously for one hour, at some appropriate mechanical employment under the direction and superintendence of its respective professor—an employment which shall not only avail something in a pecuniary point of view, but which shall preserve the health of the pupils, and make their spirits constantly elastic and buoyant, and qualify them for intense application to study without injury to their health and constitution. When these three classes have spent an hour in the operations of the work-shop, they should then be remanded by their professors to their several Academic departments, and to their studies, for the remainder of the forenoon. The classes numbered sixth, seventh, and eighth, should now leave their several departments, at ten o'clock, in the same order as the former, superintended by their respective professors, and should, like the former three classes, labor one hour in the Mechanical Institute in some appropriate occupation. They should then retire to their respective departments, giving place at eleven o'clock to the four remaining classes, the ninth, tenth, eleventh, and twelfth, who should again be employed in mechanical operations until noon. The same routine of exercises in the work-shop should be observed in the afternoon as in the forenoon, making two hours mechanical labor for each student during the day. All the proceeds of the labor of each student should be kept separately. Once a quarter there should be a public sale of all the completed articles which have not been previously disposed of at private sale, and each student should have the avails of his own work, which avails he should appropriate towards the payment of the expenses incurred in his Academic course. (26—114, 115)

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CHAPTER VII

Industrial Schools for Poor or Delinquent Children

56. **Industrial Schools for Orphans in Germany.** The experiments of Pestalozzi at Neuhof and Stanz and the success of Fellenberg and Wehrli in their Farm and Trade School at Hofwyl prepared the way for a type of industrial school that has ever since been used for two different purposes: (1) for orphans, paupers, and deserted children who are in need of a practical education and the moral and social influences and training of home life, and (2) for children and youth who through ignorance or otherwise have become guilty of some criminal offense and have been committed to an institution for correction. During the earlier years of the development of this type of school, the two purposes were not always kept separate: in fact, children of both groups were often found in the same school, but gradually there came to be a very distinct separation. A school of the first type was usually called a hospital or an orphan's home, and a school of the second type a colony, a farm school, a house of refuge, a reform school, an industrial school, etc. The name often intentionally obscured the purpose of the institution.

A third type of school which was largely influenced by the work in Fellenberg's institution grew out of the surviving remnants of the "schools of industry" of the previous century (cf. 30) which were attached to elementary schools for the poor or manual labor class of society. These can be classed neither as orphan nor as reformatory institutions yet in many essentials they were similar. This third type of school, although found in many countries, had its most significant development in England.

One of the early schools of this industrial type was established in Germany by John Daniel Falk (1770–1826). After studying at the University of Halle and gaining some reputa-

tion as a lyric poet and satirist, Falk went to live in Weimar. Here his compassion was excited by the multitude of boys running wild in the vicinity of the battlefields of Jena, Lützen, and Leipsic. Some of them belonged in the district, but many had been brought from other parts of Germany by the armies that had fought there. Falk selected the most destitute, and determined to make honest men of them. To obtain funds for this purpose he became such an importunate beggar that he was looked upon as a bore. Some good friends, however, were impressed with his sincerity and the importance of his work, and helped him in obtaining the necessary financial support. In 1818 he formed a society called "Friends in Need."

In 1820 he had 300 children in his own home. To a friend he wrote, in 1821:

> Could you see us, you would rejoice and bless God. The children of robbers and murderers sing psalms and pray; boys are making locks out of the insulting iron which was destined for their hands and feet, and are building houses which they formerly delighted to break open. Yes, it is indeed true that where chains and stocks, the lash and the prison were powerless, love comes off victorious.

Later, he wrote:

> I and my 300 children must leave our old habitation because the proprietor has sold it, and no one is willing to receive us because, as may easily be fancied, no one is willing to give up his house to 300 such children as mine. We shall build then, and with the hands of our own children, too, so that every tile in the roof, every nail in the walls, every lock on the doors, every chair and every table in the rooms, shall be a witness to their industry. (1—II, 249)

The building was constructed as Falk had said. About fifty journeymen and apprentices, all of them former inmates of the institution, assisted the boys who were there. A visitor described these boys as having "horrid, cannibal-like faces . . . with the wolf of the desert unmistakably imprinted on their foreheads. In the expression of many, however, there were traces of a new life; and Falk says it is a real pleasure to see how the claws and the shaggy tufts gradually fall off." (1—II, 250)

Although Falk has been given the credit of being the first person to establish an institution of this kind, he probably does not deserve it, for it is stated by Perthes that Baron Kottwitz,

even before Falk, had carried on a similar work in Berlin. It is an interesting fact, moreover, that these two men connected themselves with the two great sources of orphans and needy children during that period; namely, war and the factory system. While Falk took boys from the battlefields, Kottwitz took his from the factory district of Berlin. In explanation he said, "There is a population of the most abandoned character, brought together by the establishment of factories in that city, at the instance of Frederick the Great; there are 20,000 of them, and it shall be the business of my life to diminish their number." In "an ancient royal edifice" for twenty years he worked for these poor children. He gave them Christian instruction, a home, and an opportunity to work. As soon as they became accustomed to regular work and he was ready to let them leave, his object was to distribute them among the small towns in the neighborhood where workmen were scarce. Later he used "a cottage and a patch of potato land at a small rent." (1—II, 252)

In 1824 Frederick William I of Prussia established at Potsdam an institution for the maintenance and education of the orphans of soldiers. He is said to have been inspired to do this by the success of Francke's Institute at Halle (cf. 26) but he did not have the same singleness of purpose as the pious Francke, for William saw in the scheme an opportunity to train recruits for his army, and he required that every able-bodied orphan should pay for his schooling and bringing up in the orphan's institution by serving twelve years in the Prussian army, three years of which, for the more capable, were to be in a school for non-commissioned officers. In the early history of this orphan's home two attempts were made to introduce industrial work as a profit-yielding venture, but without success. "The first of these, the manufacture of Brabant lace, was introduced in 1743, and after various modifications of the mode of applying the labor of the children, it was finally abandoned in 1795. In 1744, the culture of silk was introduced extensively throughout the kingdom, and especially enjoined at the orphan-houses; but this attempt was not more successful in the end than the other, and the culture is not kept up in this institution." (2—115)

Alexander Dallas Bache (1806–1867) of Philadelphia, grandson of Benjamin Franklin, spent the two years from 1836 to 1838 in studying the schools of Europe. He was in search of ideas that would assist him in the organization and administration of Girard College for orphans, of which he became the first president. When visited by Bache in 1837 the "military orphan house at Potsdam" had three educational departments: the elementary school, the trade school, and the music school. (2—115) The aim in the trade school at that time had so changed that it was "in part, to economize the funds of the institution, by making within its walls articles of clothing required for the pupils, but more to secure the acquisition, not only of general mechanical dexterity, but of a trade, which may serve to increase their emoluments when they enter the military service." (2—123)

The trades taught in 1837 were those of the blacksmith, the saddler, the tailor, the shoemaker, and the lithographer. There were 104 pupils in the trade school and they were distributed among the trades according to the demand for the occupation after leaving the school, the space required for the equipment, the difficulties in teaching, etc. Only seven of the 104 were becoming lithographers, while 44 were taking shoemaking. With the advice of one of the officials, each boy was allowed to choose the trade he would learn. Sometimes boys were sent to the town to learn trades not taught in the school. Changes from one trade to another were rare, but were sometimes permitted. The boys worked seven hours a day under the supervision of a master workman from the town. As might be expected in a school training boys for the various branches of the military service, the blacksmiths were principally engaged in the repair of firearms, the saddlers in making caps and accoutrements, the tailors making uniforms, the shoemakers making and repairing shoes, and the lithographers in copying forms for the school or the war department, manuals, and so on. (2—123)

But the system of manual-arts instruction that had the most favorable effect upon Bache was that at the orphan's home at Frankfort-on-the-Main. He said of it:

This establishment makes no pretensions to giving an education above that intended to fit its pupils for trades, but in the means taken to give them a general mechanical dexterity, applicable to their future pursuits, as well as in the paternal character of the discipline, it is not surpassed by any of the institutions which I have visited. (2—131)

The handicraft employments are well arranged, so as to avoid two difficulties—on the one hand, that of forcing the inclination of a pupil to work which does not suit him; and on the other, allowing him to acquire habits of unsteadiness by going from one occupation to another. Each pupil is at liberty to choose which of the handicrafts he will engage in at the beginning of any quarter, but when his choice is made he must remain in this division for three months at least, unless special reasons determine the master to permit a change. The manual occupations are making baskets, mats, cord, turning, bookbinding, working in iron and brass wire, shoemaking, and tailoring. In summer, gardening is added to the list. Some boys who have a taste for music are afforded means of improving it. The little boys are occupied in knitting, a very general occupation in the German schools for young children of both sexes. Each trade has its own room, and its superintendent. There are regular instructors in those branches in which the teachers cannot give instruction. The articles made are none of them sold, but generally used in the institution. (2—135)

Two hours a day are given to instruction in the handicrafts. Besides this instruction in the manual arts, the principal house-work of the institution is done by the pupils. (2—134)

57. **Schools for Orphans in Great Britain.** In 1865 William Blake, "a woolen draper at the sign of the Golden Boy, Maiden Lane, Covent Garden," founded what was called "the Ladies Charity School" or "the Hospital at Highgate." He purchased Dorchester House for the use of the school, expending £5,000 in this benevolent project. Blake is said to have been the originator of a charity school movement. Another school was established about this same time at Kensington.

The form of pledge for the support of the school at Highgate, as printed in the prospectus of Blake's school, throws light on the viewpoints of donors of that time:

Being well informed that there is a pious, good and commendable work for maintaining near forty poor or fatherless children, born all at or near Highgate, Hornsey or Hamsted, we, whose names are subscribed, do engage or promise that if the said boys are decently clothed in blew, lined with yellow; constantly fed all alike with good and wholesom diet; taught to read, write and cast accompts, and so put out to trades, in order to live another day, then we will give" etc. (3—127)

The school at Kensington was "a free school for poor men's children" where they were taught reading and arithmetic and instructed "in all needful learning and work, and the principles of the Church." In addition to this the school intended to provide them with proper clothing and "to dispose them to useful trade." (3—129)

These schools, then, were intended to provide the immediate physical necessities, give a little schooling and to serve as a means of apprenticing the boys to trades. There is no evidence that the trades or the manual arts were taught in the schools. It is probable, however, that the children did help in the housework required to maintain the schools just as children of that time helped their mothers at home.

In 1838 Bache stated that Great Britain exceeded all other countries in the number of its eleemosynary institutions. (2—4) He said that in the city of Edinburgh and vicinity alone there were five such institutions for boys. One of these, Heriot's Hospital, which he describes in detail, may be accepted as typical. While it shows very little influence of the work of Pestalozzi and Fellenberg, a brief account of it is needed to complete the picture of the early homes for orphans in their relation to the manual arts and industrial training.

In 1623 George Heriot, a jeweller of Edinburgh, made his will providing for an institution "for the maintenance and education of poor, fatherless sons of burgesses, or freemen of the city of Edinburgh." A monumental building in the Gothic style of architecture was erected for the institution between 1627 and 1650. The leaving age was usually fourteen but "hopeful students" might receive, for four years, a sum of money to enable them to attend high school and even, later, to attend the University of Edinburgh. Boys who were bound out as apprentices to trades received pay for the apprentice fees, and the institution continued its beneficent supervision of them. (cf. 24) (2—19) The only instruction in the manual arts was in drawing. The course and methods in this subject, as observed by Bache in 1837, are said to have been the same as employed in Prussian schools of that time. They were described as follows:

The boys, after learning the first elements of linear drawing, draw from models; a simple perspective machine being used to give them an idea of the principles which they are to put in practice. At first, simple solids, bounded by straight and curved lines, are set before them, and drawn upon the slate. Then mouldings, and gradually, more complex combinations of surfaces are given, and are drawn upon paper with the crayon or pencil. (2—24)

Then the writer goes on to discuss this method in the following statements:

This method forms the eye admirably, but does little, I may say nothing, to improve the taste. Hence it is rejected by some. Nevertheless it appears to me admirably adapted for the ordinary purposes of life, and especially for the use of those engaged in mechanical pursuits, and much superior to the system of linear drawing from engravings, taught in the primary schools of France. The method has further advantage, that almost every pupil is able to acquire some proficiency in mechanical drawing and sketching by it. Every boy must attend this class for at least twelve months, before leaving the institution. (2—25)

The famous Christ's Hospital, or Blue-Coat School, in London was originally for orphans and foundlings. It was incorporated in 1553 by Edward VI. The name Blue-Coat comes from the fact that since its foundation the boys in the institution have worn the dress prescribed in its early days—a long blue coat with red leather belt, knee-breeches, yellow stockings, low shoes and a black "muffin cap." (4—135) In 1837, boys leaving this school were (a) apprenticed to a master tradesman or (b) to a merchant, or they went (c) into the navy or the merchant marine. A few went (d) to the universities. (2—69)

58. **Industrial Reform School.** Little by little it became evident that the industrial school was to provide the type of reformatory for juvenile criminals. It became clear that instead of abandoning such young delinquents to a life of crime, as had been common in times past, it was not only possible but practicable to recover a large percentage of them to respectability and usefulness. Instead of punishment, most of them needed a moral environment, real friends, and an opportunity to learn better ways and how to make an honest living. Francke is given credit for being the first to suggest the value of separating the delinquent youth from the adult criminals. (5—V, 130)-

Of the numerous schools established during the period under consideration, only a very few of the early and typical ones are here mentioned.

Redemption Institute, or Rauhen-Haus, at Horn, a few miles out of Hamburg, Germany, was established by an association of benevolent people in 1833, for the reclaiming of abandoned children of the very lowest class. From the beginning the Institute was conducted by T. H. Wichern who made it the mission of his life. "His first step was to procure a plain dwelling, and to remove everything from without or within which gave it the appearance of a place of punishment or correction." Into this house he moved his own family and "into the bosom of his family he received three boys of the worst description." In a few months nine others of the same type were added. They were all made to feel at home. They were recognized by Wichern, his wife and his sister as fellow-laborers in the garden and on the farm.

> By forgetting or forgiving the past, and encouraging every effort on the part of these depraved outcasts of society to form better manners and habits, by addressing them always in the look and tone of heartfelt interest in their welfare, by patient and long-suffering forbearance with their short-comings by touching exhibitions at appropriate times of the character and teachings of Christ, by regular instruction in the branches of an elementary education, by alternate recreation and employment, of which they received the return not only in their own comfortable lodging and support, but in small but constantly accumulating savings Mr. Wichern succeeded in working remarkable changes in the character of a large majority of all who became inmates of his family. (6—517)

By degrees the Institute was extended in a few years from a single house to nine, each on the plan of the first, providing for twelve children. It was desired to retain the family life in each of these as in the first one. There were also added such other buildings as a bakery, workshop, chapel, library and school house, stables, and so forth. Then there were three divisions in the establishment: (1) Reform school of 100, two-thirds boys and one-third girls. (2) Institute of brothers—a normal school for training chiefs of families, overseers, and the like for institutions doing a similar type of work. (3) A printing house and bookstore.

The school instruction was like that given in good elementary schools. The labor for boys included gardening, farming, shoemaking, making and mending clothes and bedding, carpentry, wooden-shoe making, spinning (in which the young children were employed) baking, housekeeping, basket-making (which employed a number of children during the winter), printing, lithographing, stereotyping, wood-engraving, bookbinding. For girls there were the duties of the household, filling the places of servants, cooks, washerwomen, laundry women and seamstresses; also mending, knitting, and some work out-of-doors. (6—519)

The most famous of the industrial reform schools of this period was the agricultural colony at Mettray, near Tours, in France, which was established in 1839. It was founded by M. Demetz and other benevolent men of France in order to demonstrate to the Government the practicability of rescuing depraved boys. The founder had already visited Redemption Institute at Horn.

M. Demetz was "a judge who descended from the bench because he could not endure the pain of consigning children to a prison when he knew their future would be made worse than their past." (6—547)

For the purposes of the colony an estate was selected within market reach of several large towns, fertile but not highly improved, capable of profitable cultivation, and free from old and undesirable buildings. A plan for the whole establishment was made at the outset, but the buildings were erected gradually as needed. It consisted of a series of houses of special construction, each adapted to a family of forty persons. Each family had its yard, fruit trees, and kitchen garden. The whole was not enclosed by high brick walls, but by low hedges. (6—493) The real confinement to the spot was in the attractiveness of the domestic life and occupations of the institution. While all the boys were taught the various kinds of work of the farm and garden, those who had an aptitude for handicraft were taught such trades as were wanted by country people, so that they could find occupation as wheelwright, harness maker, shoemaker, or blacksmith in a village away from the great

cities. Much attention, also, was paid to cultivating the taste for innocent, rational amusement. (6—494)

In England, as early as 1788, the Philanthropic Society was formed to provide a "means of industrial, moral and intellectual instruction for juvenile criminals and the destitute offsprings of convicted felons." The first work of this society was to collect about a dozen children in a hired house near London known as St. George's Fields. A master workman and his wife were to oversee the labor of these children in some handicraft. The plan soon grew to include three houses, one devoted to shoemaking, a second to tailoring, and a third to carpentry. Then the whole was merged into "one great establishment, surrounded by a high wall, with a chapel, residences for the officers and workshops for tailors, shoemakers, brush-makers, printers, carpenters, etc. The destitute and criminal youth—at first of both sexes, but afterwards the girls were excluded—were here received and instructed in some useful trade, as well as in the elementary branches of education, and then bound out as apprentices to master-workmen in the city."

John Griscom, who visited this institution in 1818, described the industrial work as follows:

> The boys receive a sufficient share of school learning, and are placed, on their admission, in one of the various manufactories or workshops, which are conducted by master workmen and journeymen. The principal trades pursued, are printing, copper-plate printing, bookbinding, shoemaking, tailoring, rope-making, and twine spinning. A portion of each boy's earnings goes to his credit, and is given to him at his discharge. Besides receiving those poor juvenile offenders in their establishment, the committee have adopted the plan of apprenticing out some of the best behaved boys, to tradesmen of good character, with a sufficient premium, but they are still considered as under the care of the society. The girls make their own clothing, and shirts for the boys; wash and mend for the manufactory; and, in short, are educated so as to qualify them for useful and respectable service. About one hundred and fifty boys are within the walls, and more than fifty girls. The society has a house, in another part of the town, called the Reform, where the most hardened offenders are first introduced, and where they are carefully instructed in the obligations of morality and religion, and in school learning. When out of school, they are here employed in picking oakum. In passing through the work shops of this beneficent institution, where industry and skill were apparent, it was cheering to find that so many wretched children were "snatched as fire brands" from criminality and ruin,

and restored to the prospects of respectable and honourable life. The chapel of the establishment is remarkable for its neatness. It serves for a considerable auditory, in addition to that of the institution. (7—I, 121)

After Sidney Turner became manager in 1846 he and the police magistrate and William E. Gladstone, then treasurer of the Philanthropic Society, visited the Mettray agricultural colony in France and other industrial schools on the same plan. On their return a plan was worked out for a reform school in which farm labor should be the principal and the trades and handicrafts the secondary occupations. A 140-acre site was obtained near Reigate in Surrey, known as the Red Hill Farm, and buildings were erected.

The school opened in 1849 with three boys. In the course of two months fifteen more came from the country districts. At the end of a year sixty-five had been admitted, including those which were in the old institution in London. (6—578)

In 1851 at a conference on preventive and reformatory schools held at Birmingham, Mr. Turner said:

Now I can fairly claim for our Red Hill Farm School that it has proved three important truths. First, that the reformation of young offenders is a very possible thing, if you seek it by the right means, viz.: by kindness, religious influence, and industrial occupation. Religious influence and teaching will not alone effect it; you must add the practical illustrations of *patience, gentleness*, and *kindness;* and even these together will not be thoroughly effective without the help of regular and healthful labor. It has proved, I say, that these agencies are at once indispensable, and tolerably certain to succeed. It has proved, also, that with regard to the sort of labor you employ there is none so useful, as a means of moral discipline, as country labor—no reformation, in short, so effective as a free, open *farm school*. The Society's school in London did little as compared with what has been done since it was transferred to Red Hill, wall and gates dispensed with, and the boys subjected to the wholesome influence of open air, free discipline, country associations, and country habits. (6—504)

The institution continued to grow. In 1871 the land had increased to 300 acres. The buildings, Fig. 23, then comprised "the chaplain's house, chapel, hall, secretary's house, infirmary, laundry, bakery, and five distinct houses, named Queen's-house, Gladstone's-house, Garston's-house, Waterland's-house, and Gurney's-house. . . . Each of these houses contains accommodations for about 60 boys, and is quite a distinct

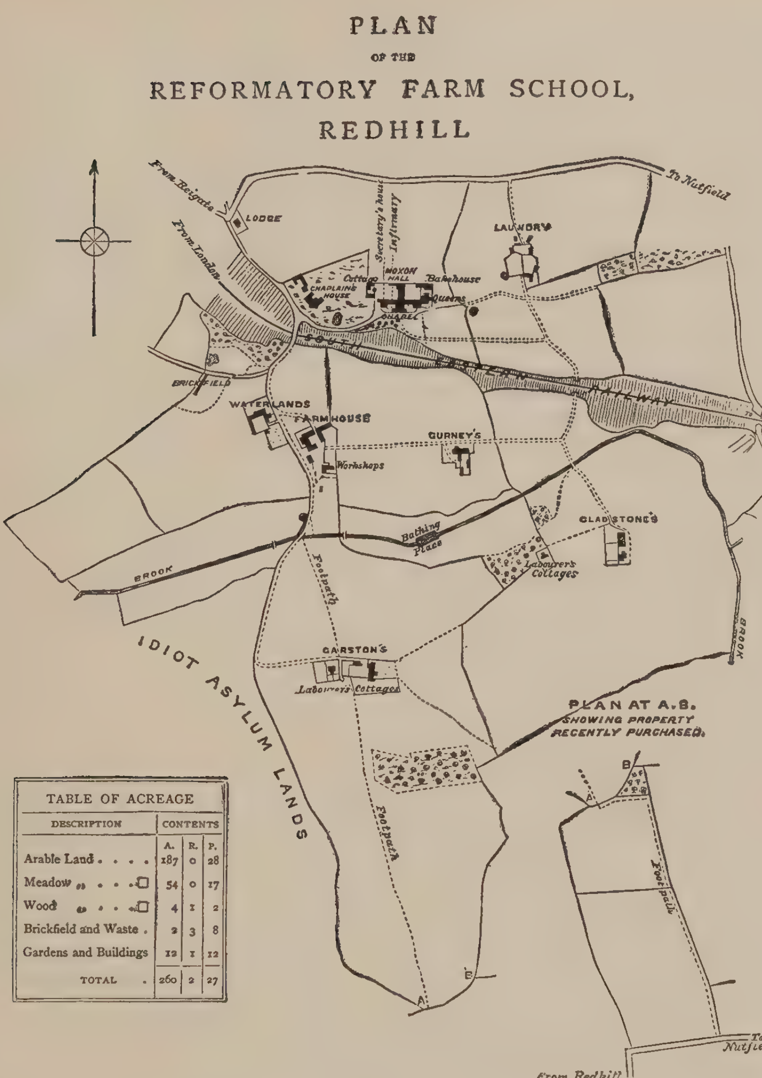

TABLE OF ACREAGE

DESCRIPTION	CONTENTS A.	R.	P.
Arable Land	187	0	28
Meadow	54	0	17
Wood	4	1	2
Brickfield and Waste .	2	3	8
Gardens and Buildings	12	1	12
TOTAL .	260	2	27

Fig. 23. Plan of Red Hill Farm School
From Bartley: *The Schools of the People*

school, having a separate master and independent domestic arrangements, so that the whole institution must be considered as comprised of five different schools under one head master." (8—261)

The schoolroom studies of the boys occupied only three hours on alternate days in summer and a little more in winter. The remainder of the time was devoted to industrial occupations. About two thirds of the boys were occupied in field work and one third in the various industries of the institution—house work, laundry work, and as bakers, tailors, shoemakers, carpenters, blacksmiths, shepherds, etc. In general, the work was done in gangs of boys, under "an industrial trainer." Every week each boy was credited with an amount ranging from 2d to 4d, depending upon his industry, skill and deportment. He was allowed to spend it for certain articles, such as "postage-stamps, periodical publications, hair-oil, gloves, treacle for puddings, expense of holidays, etc." (8—262)

59. **The Ragged Schools of England and Scotland.** In order to understand the activities of what were known as the "ragged schools" in England and the influence of the Ragged School Union, one should recall that up to 1870 there was no system of compulsory education in England. The Education Act of 1870 was the first to provide for (1) a local school tax, (2) a representative local school authority, and (3) the compulsory attendance of children. (9—21) Previous to this time the education of the poor children depended upon private philanthropy and public grants. And in spite of the multitude of missionary and charitable institutions, many children grew up without any schooling. Even after educational opportunities were provided for young criminals in reformatory institutions there was still no way for many an honest poor child to get an education. As Dr. Thomas Guthrie (1803–1873) the leading Scottish advocate of the Ragged School once said, "Their only passage to school is through the police office; their passport is conviction of crime." (10—11) He also pointed out that even if there were free schools available, many of these children would not be able to attend regularly, if at all, because as one poor mother said concerning her boy, "He maun do something for his

meat." (10—14) Dr. Guthrie could see only one way for such a poor child to remain honest and get an education: "Since he cannot attend your school unless he starves, give him food; feed him, in order to educate him; let it be food of the plainest, cheapest kind; but by that food open his way, by that powerful magnet to a hungry child, draw him to school." (10—14) Christian missionary zeal was the most powerful force behind the ragged school movement, for it was primarily to save the souls of the children rather than to develop their intellects and keep their bodies clean that schools were opened. The Bible, therefore, became the chief textbook. In the minds of some of the leaders, however, fear of revolution was added to a desire to save. During the early years of the reign of Queen Victoria, especially 1843 to 1848, due to economic pressure, there was general unrest among the laboring classes; class prejudice was growing and there were occasional outbreaks of lawlessness. Juvenile delinquency had increased at a fearful rate; entire districts in the larger towns and cities had become infested with thieves and vagrants; crime was developing systematically and like a fatal epidemic was spreading. It was under these perilous conditions that the ragged school movement began. (11—20 to 27)

But before such schools became numerous there were isolated schools carried on in the missionary spirit, some of which developed the type of school that came to be known as the "ragged school." It is generally conceded that the earliest school that provided all of the leading characteristics of this type was started in 1819 by John Pounds (1766–1839) a poor shoemaker of Portsmouth. In his cobbler's shop, which is said to have been only 6 by 18 feet in size, he was in the habit of collecting the ragged and destitute children of Portsmouth. They would listen to his lessons of honesty, sobriety and truthfulness, learn to read and how to earn an honest living. For the most part this was accomplished while he sat at his work, but if, for any reason the number of his pupils was lessened, "he was accustomed to sally forth to the quays of Portsmouth" to persuade more youngsters to join his ragged class. If his offer of lessons failed he had a surer method which was nothing

more or less than "a piping hot potato, a tempting bait for a hungry lad." In the twenty years before his death more than 500 destitute children were members of this cobbler's school. In practical ways he "cared for the bodies, minds, and souls of his scholars. Moreover, he gave large numbers of them a start in industrial life." (11—36)

A more effective movement toward reaching the poor children was started in Aberdeen, Scotland, by Sheriff Watson in 1841. During the next few years such schools began to spring up in most of the larger cities of Great Britain—Edinburgh, London, Manchester, Liverpool, and elsewhere—and in a few more years they were multiplying rapidly.

The term "ragged school" was adopted hastily, in 1842, by the secretary of a school just starting in order to give point to a public appeal for funds. The advertisement caught the eye of Lord Ashley and brought to the cause the strength of his support. His, in time, brought that of the Queen and many social leaders. A conference was called which resulted in his being made the official leader of the ragged school movement. In 1844 the Ragged School Union was formed with Lord Ashley as president—a position which he occupied until his death forty-one years later. (12—1387)

As already indicated, the ragged schools were started by men and women who were alarmed at the rising tide of lawlessness, and aroused to sympathy on account of the poverty, suffering, and degradation about them. "The first comers to the schools seemed to have no notion of anything which obtained in respectable, decent life; no notion of order, obedience, discipline, cleansing or washing of any kind; no notion of propriety, or of the first elements of education, of parental care, of filial duty, or right or duty of any kind. In fact, the ragged schools had to set to work at the mighty task of redressing these evils by endeavoring to supply by all the means in their power at the very outset the want of domestic training, of parental, care, and family teaching." (11—31)

The teachers in the schools were volunteers who worked without financial reward. But they came in great numbers from all classes of society and all sorts of occupations, "even

to a crossing sweeper." Although social distinctions were more powerful at that time than at the present, they did not prevent the welding together of the workers in the great cause. "The problems to be solved in the ragged schools were so difficult, and the evils to be removed so appalling, that all else was forgotten." (11—106)

Under such conditions it is clear that the early ragged schools were not troubled with regent's examinations, passing marks, or promotions. Neither were they worried by ideas of uniformity of curriculum. Each school taught what it had the means and the ideals to attempt. Yet perhaps it may be said that all sought first of all to save the souls of the pupils. To do this meant giving religious instruction and that, in turn, meant teaching pupils to read the Bible. Saving the soul also meant the inculcation of habits of honesty, truthfulness, industry, skill, and obedience to law. And along with these habits there should come the observance of the proprieties of respectable life. Industrial work of some sort was considered an important factor in these schools, yet many of them had none. Moreover, some of the schools were day schools, while many were in session only evenings and on Sundays. The following typical programs of day schools will reveal something of their character:

I. Dr. Guthrie of Edinburgh gives the following winter program. In the summer the day is an hour longer—twelve hours. (10—193, 194)

8:00 to 8:30	Ablutions
8:30 to 9:30	All working
9:30 to 10:15	Breakfast and play
10:15 to 11:00	Calling roll and Bible lesson
11:00 to 1:00	One half in schoolroom and other half in work room
1:00 to 2:00	All walking
2:00 to 2:30	Dinner
2:30 to 3:00	All in schoolroom
3:00 to 5:00	One half in schoolroom and other half in work room
5:00 to 6:30	All working
6:30 to 7:15	Supper and closing

II. Rev. J. F. Bryan, governor of the Manchester ragged, industrial, and reformatory schools in 1856 gave the following program of the Ragged School of St. John's Parade, Manchester:

The children who sleep on the premises rise at half-past five o'clock to prepare the rooms for the work of the day. The remainder, sleeping at home assemble at seven o'clock. After the usual inspection to insure cleanliness, the whole of the children have breakfast preparatory to the religious exercises of the day, which consist in singing the praises of God, listening to an allotted portion of His Holy word, and in prayer. They are then occupied until noon in endeavouring to obtain an elementary knowledge of the usual branches of an ordinary education; school work over, they dine together; and after a little out-door recreation, enter upon the industrial part of the proceedings, at which they are engaged the whole of the afternoon, being usually divided into six classes, or bands of workpeople, who are occupied as follows: class one, assorting bristles; class two, making paper and canvas bags for the tea and coffee dealers; class three, clog making; class four, tailoring; class five, printing; class six, girls making their own clothes, and shirts for the boys. Our motto is "If any will not work neither shall he eat," and it is truly a pleasing feature in these institutions, that when all the children are fully occupied, gaining a knowledge of some handicraft whereby they may earn their own bread, they appear so blythe and cheerful, you could scarce suppose they had ever known want, or had been habituated to a life of idleness.

As would be expected under such conditions, the industrial work when it was taught was as varied and as unorganized as the other subjects taught. The economic pressure, the necessity of finding some juvenile employment for the children was a larger factor in determining what should be taught than any strictly educational consideration. This was further conditioned by the knowledge and skill of the teacher or teachers in any given school. The industrial work, however, was looked upon as extremely valuable. One writer of that time said:

Intellectual teaching is feeble in the work of reformation. The hand and the eye must be taught to work as well as the head stored with book-learning, and a school which has no industrial class leaves an essential part of the engine of improvement unemployed. (11—194)

In 1855 in the city of London alone there were fifty ragged schools with industrial classes. The number of children employed in them was about 2,000.

Boys were instructed by masters in tailoring and shoemaking, making and mending the clothes of their school, or the articles made were sometimes sold at low prices. Wood-chopping was another employment in which many were engaged and the faggots thus prepared for firewood were bought by those interested in the school. Horse-hair picking, carpentry, mat-making, knitting fishermen's nets, paper-bag printing, and ornamental leather work are

referred to as being occupations of the scholars at this time. For the girls there was sewing, knitting and embroidery. (11—195)

The effect of this industrial work was "to impart a healthy tone" to the schools where it was carried on. (Fig. 24) (Fig. 25)

The good results of the ragged schools were evident in many ways but most notably in the reduction in juvenile crime. In 1855 the first ragged school came into operation in Brad-

Fig. 24. Carpentering Class in a Ragged School
From Montague: *Sixty Years in Waifdom*

ford. In that year "the police books recorded no fewer than 111 cases of juvenile delinquency. In the year following this number fell to 76, the next year to 47, and last year (1858) to 26. These results were fairly ascribable to the influence of the ragged schools." (13—449) In London a reduction of 75 per cent was said to be due largely to these schools. In 1862 the chief of police in London "called attention to the fact that from a ragged school, at its foundation attended mainly by thieves, through which in five years 12,000 children had passed, there had not been a single police-court case. This was in the district where Fagin, the Dodger, Charley Bates and Noah Claypole were drawn from the life." (11—300) As an illustration of the activity of these schools in seeking positions

for their pupils it may be mentioned that in the year 1864 the London ragged schools placed 1,920 domestic servants. (11—290)

The remarkable growth of the schools under the Ragged School Union of London is illustrated by the graph, Fig. 26, (10—105) which shows the number of voluntary teachers engaged in these schools. It is especially noticeable how rapidly the curves rise until 1870 when the compulsory education act was passed. Then comes a falling off because the secular scho-

Fig. 25. Sewing Class in a Ragged School
From Montague: *Sixty Years in Waifdom*

lastic instruction was taken over by the Board Schools, but the curve again rises at nearly the same rate until the peak in 1894.

The ragged schools helped to prepare the public mind for the free compulsory elementary education at public expense. They were also the forerunners of the polytechnic schools of London. The original polytechnic, the Regent Street, started as a ragged school. It was a ragged school grown up to man size in its interests and opportunities.

The ragged schools of Great Britain were only one factor in a social and industrial evolution but they were a sufficiently important factor to receive the whole-hearted support of Lord Shaftesbury (formerly Lord Ashley), Dr. Guthrie and scores of other men and women of social prominence. Clergymen of

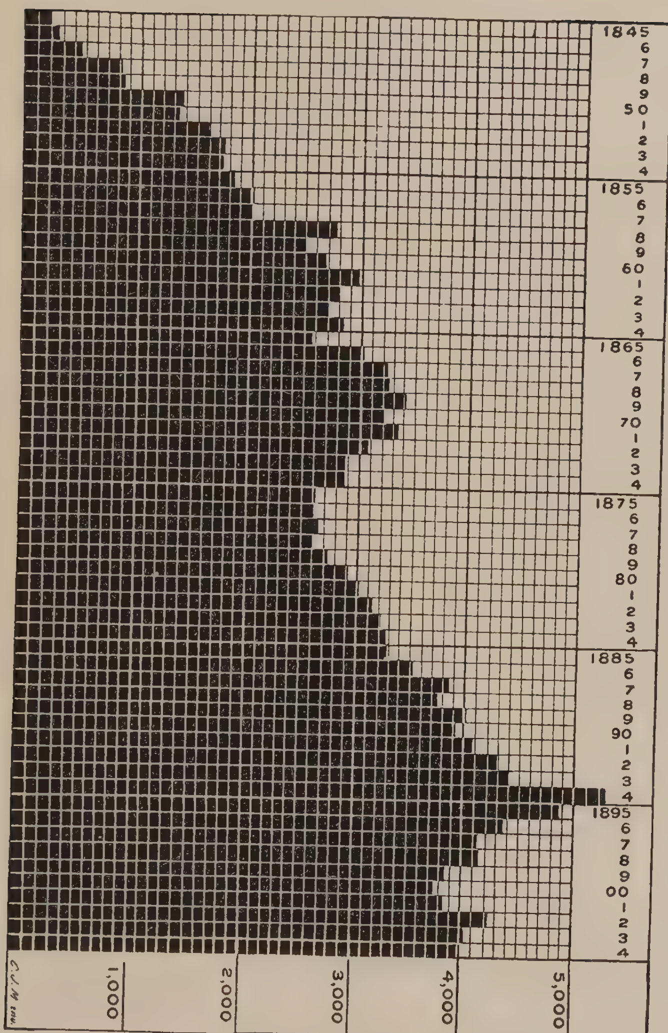

FIG. 26. NUMBER OF VOLUNTARY TEACHERS IN THE SCHOOLS OF THE RAGGED SCHOOL UNION, 1845 to 1905. EACH COMPLETE BLACK OBLONG REPRESENTS 100 TEACHERS. FROM MONTAGUE: *Sixty Years in Waifdom*

all denominations, social workers and literary men all joined hands in the fight against lawlessness, wickedness, ignorance, and poverty. Among the literary men Charles Dickens was one of the warmest supporters of the ragged schools.

60. **"Certified Industrial Schools" in England.** Again one should call to mind the fact that during the period under consideration only the children of the lower classes of society or children of the poor attended elementary schools supported, even in part, at public expense. It was not until 1833 that any grant of public funds in England was made for elementary education, and even these funds, £20,000, were used only for the erection of school buildings. (8—2) Education among the middle and upper-class people was a private matter; it was supported by the tuition fees of the pupils and by funds from religious organizations and from private donations, gifts, and endowments. The children of the lower classes went to charity schools, pauper schools, poor-law (workhouse) schools and half-time schools. Even in 1861, when the Revised Code of laws governing elementary education was adopted, the purpose of the Government grants was "to promote the education of children belonging to the classes who support themselves by manual labor." There was no attempt to provide free elementary education for all classes alike.

And of all the schools for the lower classes the industrial schools were usually for the lowest or the poorest. These schools were the direct descendants of the "schools of industry" of the previous century (cf. 30). Because most parents among the poorer classes failed to appreciate the value of education and because they considered that it was their right to profit by the labor of their children, they often resisted the influences which would tend to take the children from labor, and put them into the school. To overcome this objection to education the school of industry provided farm labor or labor in some minor industry, in connection with instruction in religion, reading, and writing, which would yield, sometimes, almost as much profit to the parents as they would get if the children were kept at labor all the time. In the beginning, therefore, the school of industry was a device for "earning while you learn."

Industrial schools aimed, first, to save the souls of the boys and girls by teaching them to read the Bible, and, second, to help them to earn an honest living. For a long time there was no distinction between ragged schools and industrial schools, and both were often classed with reform schools. They were all intended to reach the poorest, most unfortunate and degraded children. When the Government began to recognize its responsibility for the education of delinquents as a means of safeguarding the state, the industrial schools entered upon a new era.

In 1843 the Committee of Council on Education, a special committee of the Privy Council, established in 1839, to administer funds voted for education by the House of Commons, asked for a report on the success which had attended the operation of industrial schools. As a result of this inquiry, in 1846 certain conditions were named under which annual grants would be made by the Government to such schools. Subject to approval of the teacher and his mode of instruction, aid was to be given toward (a) the rent, (b) the cost of tools, and (c) the teacher's salary in schools designated as follows: (1) "School field gardens, (2) workshops for trades, (3) school kitchens and washhouses." (8—243)

This continued until 1852 when the Committee of Council reconsidered the subject of aiding in the formation of these industrial institutions, in the hope of putting them somewhat on the same footing as ordinary elementary schools. Accordingly, a grant was made of 10s. a year on each student in aid of the expenses attendant on his industrial training, in addition to the assistance toward rent, etc., of the premises. These grants, however, were taken advantage of to a very small extent.

Two years later, in 1854, "Certified Reformatory Schools were introduced giving board and lodging to inmates." This plan proved to be "useless for the class of children contemplated to be trained in industrial schools." "In 1856 the Committee of Council gave aid, but schools so aided must be 'refuge or reformatory, or be in connection with an ordinary elementary school,' and 'no school should be admissible which was not

industrial in character and unless its scholars were taken exclusively from the criminal and abandoned classes.' " (8—243) These arrangements, however, were not satisfactory, and "in 1857 an Act was passed which simplified their administration and encouraged the transformation of those ragged schools which were organized as asylums or refuges into certified industrial schools. It empowered the Committee of Council to certify any school, not being a reformatory, in which industrial training was given, and in which food as well as education was provided. Children under fifteen years of age, taken into custody on a charge of vagrancy, might, if orphan or destitute, be at once sent by a justice of peace to such a certified school. Those who were thus charged, and were not orphans, but whose parents or guardians refused to give assurance of their good behavior for twelve months, might also be sent to the same institution, and their parents be required, according to their means, to pay for their keep any sum not exceeding 3s. a week." (8—245)

This Act provided aid for (a) half of the rent, (b) one third of the cost of tools and raw materials, (c) five shillings a year for each pupil, (d) assistance in the purchase of books, maps, and apparatus, and (e) certain increases in teachers' salaries. But the provisions were such that the Act was almost inoperative. In 1860 only 19 schools had come under the provisions of the Act and only 200 children were being instructed in these schools. The conditions were modified in 1861, and there were 30 schools meeting the conditions for grants in 1866. Then came the Industrial Schools Act of 1866. This met the conditions still better, so that in 1868 there were 69 schools with an attendance of 8,659 pupils meeting the requirements for grants. (8—245)

Thus the ragged school, started in the missionary spirit to attract and rescue depraved children, became a certified industrial school, supported in part by the Government, to which vagrant and destitute children were committed by a magistrate or justice of the peace. Statistics had been gathered by officials which made it evident that education in the ordinary schools for the poor did not necessarily reduce crime. Many of the

young criminals of that day could read well and a few could write well. Some of the quickest-minded children were found among the boys who were repeatedly returned to the reformatories. In 1846 the governor of the Edinburgh jail, in giving evidence before the House of Lords, said, "The number of recommitments of those who can read well is much greater than those who cannot read at all." (14—XVI) Other testimony, however, showed that they were reading the wrong kind of books. Another official is quoted as saying:

> Our consciences are far too easily satisfied by collecting together a number of children, or even by enrolling their names in the books of our schools, without enquiring what they actually learn that is good and useful; and then we are surprised that education does not do its part in the prevention of crime. But it is not reading or writing or arithmetic or grammar or geography or history which forms the character, or makes a good member of society. These things may only give a greater power for evil, if such instruction be considered as the sole means of education, and be allowed to stand alone, without any regulating principles of action, or aids for their employment in good purposes. (14—XII)

Such reasoning led to conclusions such as these: (1) There was a deplorable lack of moral training in the schools of the poor, (2) Reform in the teaching of morals was necessary, and (3) That manual work, which helped in the formation of habits of industry and provided a means of earning an honest livelihood, was an essential factor in any successful scheme for reforming delinquents and young criminals. The following summary of the matter was given official sanction:

> I have been from my earliest infancy a devoted advocate for education; but I am satisfied that the cause of juvenile crime is not the absence of education; and that any education of the children of the laboring classes that is not accompanied with industrial training, and their actual employment in manual and useful labor, will entirely fail in checking the growth of crime. (14—XIII) (Source Material VII, A)

61. **Industrial Work in English Elementary Schools for the Poor.** The same general argument which was accepted for industrial work in reform schools was considered applicable to industrial work in all elementary schools for the poor. The "schools of industry" of the previous century had prepared the way for this broadened conception of the value of industrial work in connection with elementary schools. In these schools

farm work and gardening were favored for the boys and needlework and sometimes cooking and housework for girls. The following excerpts from reports of Government inspectors reveal some of the characteristics of this work:

At ——— there is a large playground, surrounded by small gardens, which are cultivated by the children who have earned the privilege by their good conduct. This plan cannot be too strongly recommended. It promotes habits of cheerful industry, gives a practical illustration of the laws of property, and affords a ready and satisfactory test of discipline, and even of the feelings of the school. I have strongly recommended the introduction of this system in village schools, as, for instance, at ———, where there is a site of more than an acre in extent. I am, moreover, of opinion that more extensive benefits may be secured by gradually making such allotments the foundation of an industrial school. (From report of 1845) (14—104)

The industrial school at ——— was grafted on the National School, chiefly in order to give the elder boys a longer time for receiving education. About 20 have thus been retained for a longer or shorter period, at school, the present number employed being 10, of whom most have been so retained for the full period, two years. Our average number at the National School is between 50 and 60. The industrial school commenced in October, 1847; 7 acres of land were taken into cultivation, and a gardener engaged, at 15s. per week to act as general manager and instructor of the boys in gardening, etc. The boys work under him, and are sent to school as often as they can be spared, which, for the elder ones, is generally half of every day; for the younger, more. By this method they have the opportunity of learning all kinds of gardening and farm work, which is much better than if they had merely a little plat of ground to cultivate separately. Several of them have thus become good gardeners. They are paid regular wages, in proportion to their age; and some are boarded with the above-mentioned gardener in the place. Of the 7 acres, from 2½ to 3 acres are kept for garden crops (for which there is good market) and on the rest are grown wheat and beans. The former pay far best; particularly such crops as lettuce (early in the year), potatoes and cauliflower. Every kind of garden stuff, however, is grown. Our vegetables gained the first prize at the last ——— garden show. Pigs are kept, and are essential, both for their manure and in order to consume much of the refuse of the garden, which would otherwise be wasted. They serve to consume also all our crops of beans, turnips, mangel wurzel, etc. (14—105)

Scheme of Industrial Instruction in the National School of ———: Every boy aged 11 years or more has a garden of two poles, rent free, to cultivate for his own use; and keeps a debtor and creditor account of the value of the produce and of the expenses of his garden. Every boy is employed one hour and a half in the afternoon daily, except Saturday, in cultivating his own garden, or in cultivating a plot of ground for the benefit of the school establishment, or in some other industrial occupation. The boys are encouraged in working in their own gardens in play-hours and before and after school-hours. The boys are employed in classes of four, alternately, every

Friday, from 8 till 9 o'clock a.m., in cleaning knives, pumping water, and chopping wood, for the girls' industrial school. Pecuniary and other rewards are given to those boys who cultivate most successfully their own gardens, who keep the best account of the cost and produce of their gardens, and who are most punctual in attendance. On some occasions, when the boys work in the garden at extra hours, they are paid for their labour. The hours for industrial occupations of the girls, in addition to those commonly employed in knitting, sewing, etc., are, on Monday afternoon, not exceeding one hour, in making an inventory of clothes to be washed, in sorting and putting them in soak; on Tuesday morning not exceeding three hours, in washing and cooking; on Wednesday, not exceeding half an hour in the morning and half an hour in the afternoon, in drying clothes; on Thursday, not exceeding one hour, in damping, folding, and starching; on Friday, not exceeding two hours in the afternoon, in ironing, mangling, etc.; on Saturday three hours in the morning, in baking, sewing, knitting, cleaning, etc. (14—108)

One great obstacle to their (Industrial Schools) establishment seems to be, the late hour at which our children are assembled, namely, nine o'clock. In France, I understand, the children very frequently meet at eight. If this plan were adopted, an additional hour would be gained for intellectual exercise during the morning, when the mind is best fitted to receive impressions. Four hours' mental work, with short intervals, is I imagine, as much as children of the age of 10 to 12 years can sustain with success during the day. In corroboration of this, it will usually be found that girls in schools receive instruction *under the same teachers* as the boys, and are their equals in proficiency, although they are always employed during the afternoons in industrial occupations. By this means the whole of the afternoons might be devoted to works of industry; boys might be instructed in those branches of agricultural pursuits which would be useful to them in after-life; the master of the school would be benefited by the relaxation and out-door employment in which he was engaged; moral teaching and discipline would be as effectually carried on in the field as in the schoolroom, and the farmers would not have to deplore, which is now so frequently the case, the inability of the boys, when they leave the school, to perform properly the work allotted to them. (1846) (14—109)

In the above statements one can see an effort to unite the farm and the school in some of the villages of England, but there seems to be little evidence that labor and instruction were unified in any such degree as was done by Wehrli in the farm school of Fellenberg's institution at an earlier period. (cf. 39) Probably there were few Wehrlis for teachers in England. Gradually, however, the industrial work was emerging from the school-of-industry idea of the eighteenth century. There was a definite and important development in the direction of adapting certain kinds of industrial work to school conditions where one teacher taught a large group of children

instead of a few. This was especially true in the case of needlework for girls. The system of samplers and other progressively graded exercises or problems employed in teaching the fundamental processes of sewing was a long step forward because it was the direct result of analyses made of the sewing processes with reference to teaching. (Source Material VII, B and VII, C)

Not only was there an adaptation of the industrial work to school conditions, but there was developing a new viewpoint concerning its value and purpose. In a paper before the Statistical Society of London in 1839 James Phillips Kay, Assistant Poor-Law Commissioner, stated with positiveness that the object of industrial work in the schools for the poor children was "not to make profit of their labor" (15—I, 24), but to help them to acquire "habits of industry, skill in some useful art, and such correct moral habits," as to render their services desirable. (15—I, 17) Furthermore, he recognized that for the security of property and the good order of the community it was desirable that the schools turn out hardy and intelligent workmen of good character. (15—I, 23) (Source Material VII, A)

Some leaders of thought in that period, however, did not approve of the industrial work. One writer said of the industrial schools, "They are to be regarded with caution and distrust." He considered apprenticeship preferable as a means of training for an industrial pursuit. He agreed with the report of the National Society for Promoting the Education of the Poor in the Principles of the Established Church which proposed to "devote the time spent by poor children to mental and moral instruction." The officers of this Society deprecated trying to make "the school process bear directly on a boy's future occupation." They preferred giving "a liberal education by which is meant an education in things not necessary to be learnt for the purpose of a livelihood, but learnt for their intrinsic value and salutary influences." Such an education, they thought, would produce "not only better men but better artisans by elevating and humanizing their whole nature, and thus enabling them to infuse new life into their ordinary mechanical employments." (16—XL, 441)

To a few progressive schoolmasters who had given the industrial work a fair trial in their schools, it had a value in school beyond enabling a child to earn money, beyond teaching him an industrial occupation, more important than preventing idleness. They saw in it, when utilized at its best, a means of strengthening the instruction in other subjects. With Wehrli they began to see in well-organized industrial work a means of enriching that "liberal education" that the opponents of industrial work were demanding. This is well illustrated in the viewpoint of William Davis, who used printing as industrial work in the Gower's Walk School, Whitechapel, London. "He had been very much engaged in adapting schools to the plan of mixing industry with education." (17—XX, 121) Mr. Davis believed that printing in his school had justified itself as a means of general education. In his school a boy usually began work in printing at the age of nine or ten years. He might then spend about three hours a day in the printing shop. This work was voluntary. It was, however, elected by the strongest students in the school. "The boys who did not avail themselves of the opportunities thus afforded were considerably less advanced in their intellectual studies than those who worked in the printing shop. The prizes given for reading, writing and ciphering, were invariably gained by those boys who were mostly employed in printing." Very few of the boys became printers after leaving school. In fact, "no attempt was made to teach printing as a trade, for no boy learned its processes throughout; the studious endeavor of the managers and teachers being that the whole school course should, as far as possible, by the inculcation of habits of industry and obedience, prepare the boy for his future life as a citizen, and in their opinion, the teaching of an industrial occupation during the school career considerably furthered that object." (17—XX, 121)

Even here there seems to be no evidence that the schoolmasters or the workmen who directed the activities of the boys had caught the idea of process analysis and organizing the industrial work on a pedagogical basis. In that respect the directors of the work in sewing had progressed beyond those

who directed the industrial work for boys. They had earned the right to be called teachers of needlecraft. As previously stated (cf. 35), drawing was the first of the manual arts to be reduced to pedagogical form; now we find that in some of the English schools sewing had been reduced to the same form before 1850; but shopwork for boys was yet waiting for the schoolmaster's magic touch which came later.

62. **Drawing and Industrial Work in German Elementary Schools.** The development of industrial work in the elementary schools on the Continent of Europe was quite different in some respects from that in Great Britain, although it had the same motive force behind it—the teachings of Pestalozzi and the successful application of these teachings by Fellenberg and Wehrli. It had, also, the same remote background of the "schools of industry." The chief difference was due to the fact that, while in England compulsory school attendance did not come until 1870, in Central Germany it came much earlier. In fact the notion of education made compulsory by the State had its origin in Germany. The idea dates back to the Reformation when Luther and his associates advocated universal education supported and controlled by the State instead of the Church. (cf. 13) This idea grew, and as early as 1619 school attendance was made compulsory in Weimar for all children from 6 to 12 years of age. "In 1642 the same principle was adopted in Gotha. In 1773 compulsory attendance was made effective in Saxony, the ages embraced being from the fifth to the fourteenth year. In 1717 the king issued the first law of compulsory attendance in Prussia." This provided that "wherever there are schools in the place the parents shall be obliged, under severe penalties, to send their children to school." "School is to be attended daily in winter, but in summer at least twice a week." "In cases where parents have not the means to pay so much, the fee is to be paid from the community's funds." In 1763 general school regulations united the various existing school ordinances. The purpose of this legislation is made evident by the General Code of 1794 which states that "the instruction in school must be continued until the child is found to possess the knowledge necessary to every rational being." (5—I, 286)

When Bache visited the schools of Prussia in 1837 he found that the compulsory attendance laws were very unevenly enforced (2—6) yet all children between the ages of seven and fourteen were supposed to go to school regularly (2—228). In spite of this unevenness, however, he considered Prussia "in advance of the other larger German States in the education of the people." After the revolution of 1848, elementary education was free in a large part of Germany. Joseph Kay, in writing soon after this date said:

> The poorest man can send his child free of all expense to the best of the public schools of his district. And, besides this, the authorities of the parish or town, in which a parent lives who is too poor to clothe his children decently enough for school attendance, are obliged to clothe them for him, and to provide them with books, pencils, pens, and everything necessary for school attendance, so that a poor man, instead of being obliged to pay something out of his small earnings for the education of his children is, on the contrary, actually paid for sending them to school. (18—II, 49)

Moreover, the law relating to factory children passed in 1839 required that a child must have received three years of "regular instruction in a school" before he could procure a work-certificate from the school committee which would allow him to go to work before the age of sixteen, and in no case could he be employed in a factory or mine or in building operations before the age of nine years. (18—II, 50) In the Duchy of Baden this age limit was the completion of the eleventh year. (18—II, 305) The only exception to this rule was where the manufacturers provided for the education of the children by maintaining factory schools. (18—II, 50) (Source Material VII, D) In the Duchy of Baden these factory schools were subject to the following regulations:

> No greater number of children than seventy may ever be educated together at the same time.
>
> The secular education given to them, must correspond to that prescribed by law, for the primary schools in general.
>
> No person may be selected, as a teacher of one of these schools, who has not obtained a diploma from the committee of public examiners for the Duchy.
>
> Each child attending a factory must receive, at least, two hours' instruction in the factory school.

The hours of instruction should precede the morning and afternoon's working hours; but where this is impossible, an hour's relaxation must intervene between the hours of labour and the commencement of the hours of study.

In the middle of the above-mentioned morning and afternoon working hours, the children must be allowed to take a quarter of an hour's exercise outside the mill, and in the middle of the day, there must be an interval of a full hour, between the morning and the afternoon working hours.

Young people under the age of fifteen, are not to be employed more than twelve hours a day in the factory and factory school together.

Such young people are not to be employed in labour, before five o'clock in the morning, nor after five in the evening, nor on Sundays or holidays.

All masters of factories, who employ young people under the age of fifteen must render periodical lists of the children employed by them; giving the names, ages, places of residence, and names of the parents of such children.

Any infringement of any of the above regulations will render the manufacturer offending liable to fines, the amount of which is fixed by law.

The county magistrates are charged with the strenuous enforcement of these regulations.

All the expenses of the education of the children attending a factory before the completion of their fourteenth year, must be borne by the owner of the factory which they attend.

It will be seen, therefore, that the conditions which developed industrial work in the elementary schools of Germany were different from those in England. In Germany the State removed the economic condition which in England prevented children from attending school. Therefore industrial work received comparatively little attention during this period in the northern part of Germany though many industrial schools developed in Bavaria. What was true in Germany was more or less true in the other countries of Europe so that in the several countries one could find varying degrees of industrial work depending upon economic conditions, school laws and the sensitiveness of the officials to the new educational method of Pestalozzi and his followers. (Source Material VII, E)

There were, however, two forms of manual-arts instruction which were well developed in many of the German schools during the period under consideration. One was drawing, more especially for boys, and the other was needlework for girls. For example, Joseph Kay gives a table showing the number of hours devoted to each school subject in the primary schools of Dresden. This table shows that in classes for boys two hours a week for two years were given to drawing, and for girls one

hour a week for one year. The girls received instruction in sewing and knitting for three years—four hours a week the first year, six the second and ten the third. This instruction in sewing and knitting was given afternoons for an hour and a half, after the boys had left, by a woman who was "paid to conduct this necessary branch of feminine instruction." (18—II, 253) In most of the German elementary schools for girls as well as for boys the regular teachers were men. This is why women were employed for "feminine instruction." These afternoon sewing and knitting classes for girls were often termed "industrial classes." The work done in them included gown and shirt-making in addition to the elementary processes of sewing and knitting. Usually the girls made clothes for themselves or their relatives, but if nothing of that kind was wanted, the school committee was required by law to provide them with materials for use in the industrial work. (18—II, 302)

In the burgher schools of Leipsic the number of hours per week given to drawing during the six years beginning with the lowest were, in 1837, as follows: 1, 2, 3, 3, 4, 4. (2—282) The course of instruction was known as "Schmidt's method" devised by P. Schmidt, teacher in the Royal Realschule in Berlin. In outline by years this course was:

(1) Preparatory exercises. Regular figures.
(2) Drawing of bodies in elevation.
(3) Solids bounded by plane figures and straight lines.
(4) Solids bounded by plane figures and straight lines, with shadows.
(5) Solids bounded by curved surfaces. (6—126)

Concerning the course of instruction in drawing in the German schools Dr. Calvin E. Stowe of Cincinnati, who made a study of elementary public instruction in Europe in 1839, reported the following two-year course for children from twelve to fourteen years of age:

Elements of Drawing. For this the pupils have already been prepared by the exercises in ornamental writing in the previous part of the course. They have already acquired that accuracy of sight and steadiness of hand which are among the most essential requisites in drawing well. The first exercises are in drawing lines, and the most simple mathematical figures, such as the square, the cube, the triangle, the parallelogram; generally from wooden models, placed at some little distance on a shelf, before the class. From this

they proceed to architectural figures, such as doors, windows, columns, facades. Then the figures of animals, such as a horse, a cow, an elephant; first from other pictures, and then from Nature. A plant, a rose, or some flower is placed upon a shelf, and the class make a picture of it. From this they proceed to landscape painting, historical painting, and the higher branches of the art, according to their time and capacity. All learn enough of drawing to use it in the common business of life, such as plotting a field, laying out a canal, or drawing the plan of a building; and many attain to a high degree of excellence. (6—59)

63. **Industrial Schools for Orphans and Poor Children in America.** Although America, from Colonial times accepted the principle of education at public expense, and although local communities often assumed the entire responsibility for both the maintenance and education of orphans and the children of the extremely poor, the care and education of certain types of children was very largely taken over by philanthropic and religious organizations and institutions. This was true until a later period when such institutions were usually supported by taxation, either municipal or state. Among such children were orphans, the deaf, the blind, the feeble minded, the Negroes, and the Indians. In many of the institutions for these children the industrial school idea took deep root, and some of them have contributed much to the development of industrial education in America. A pioneer school of this type, known as The Farm and Trades School was established by private philanthropy in the city of Boston, Massachusetts, in the year 1814. It began its career in the historic home of Sir William Phipps on the corner of Salem and Charter Streets, but in 1833 it was moved to Thompson's Island in Boston Harbor where it has remained and continued to grow in usefulness. This island has an area of 157 acres. Nearly a dozen trades and occupations are well taught in this school.

When a representative of the Swedish Government made a study of education in America about 1850 he reported that orphan asylums existed "in great number in America;" in the city of New York, for instance, he said there were no less than six. He then called special attention to Girard College in Philadelphia as the most outstanding institution of this class. (19—273) This famous school and home for orphans

came into being by the will of Stephen Girard, (1750–1831). He was born in Bordeaux, France, but came to America in early youth. He was "first a common sailor, then a commander of a ship of his own, and ultimately a merchant" in Philadelphia. (19—274) When he died he left $2,000,000 to establish an institution to maintain and educate white male orphans. During the time intervening between Mr. Girard's death in 1831 and the opening of the institution to students in 1848 the first president, Alexander Dallas Bache (cf. 56) spent two years in Europe studying schools—especially schools for orphans and other children of the poor. During that time, also, the main building of the college was built in the form of a Greek temple and according to specific directions in the will of Mr. Girard. When the school opened in 1848 no provision had been made for industrial training although that same year a committee of the Board of Trustees reported that "some mechanical instruction should be introduced." While Mr. Girard did not expressly provide for such training, the trustees were free to introduce it if they considered it desirable. In the report of 1850 "it is indicated that at the age of ten years a boy of the College might begin to wait upon himself and look out for himself in certain ways, and that at the age of twelve years, he might begin to receive practical experience along shop lines. In 1859 the President of the Board directly recommended the erection of workshops for handwork education." (20—36) In 1862 the handwork instruction was regarded as successful and plans were being made to develop it further. In 1864 provision was made for instruction in "type-setting, printing, bookbinding, type-founding, stereotyping, turning, carpentering, daguerreotyping, photography, electrotyping, electroplating, and practical instruction in the operation of the electric telegraph." (4—466)

This work was given to selected students only. After the Centennial Exposition of 1876 the manual work received a new impulse, was largely extended and became a part of the course of instruction of every boy.

At the close of the Civil War there were important Negro problems to be solved. There were many adjustments to be

made between former masters and the ex-slaves. To aid in these adjustments and to settle questions of law and order, the Freedman's Bureau was established. The Bureau also took charge of the educational facilities for the negroes. Into the service of this Bureau, as one of eight agents in charge of the work in Virginia came General Samuel Chapman Armstrong (1839–1893) who had recently been in command of the Eighth Regiment of United States Colored troops. He was given control over ten counties with headquarters at Hampton, Virginia, where he arrived in March 1866. As superintendent of all the Negro schools in these counties he quickly became acquainted with the difficulties of his problem. Although educated for two years at Williams College he had been born and reared in the Hawaiian Islands and he knew the Negro much as a Southern planter knew him. From his first entrance into the work of the Freedman's Bureau he gained the confidence and good will of both the whites and the blacks. And he had not been at Hampton long before "there began to grow in his mind thoughts of an educational institution for the Negroes different from any he saw there, and adapted especially to the needs of the ex-slaves." (21—154) "As he meditated upon the development of the plan, the Hilo Manual Labor School for Native Hawaiians, which he had observed in his boyhood, often occurred to his mind as an example of successful industrial education for an undeveloped race." (21—155) This was a boarding school in which the Hawaiian boys "paid their expenses by working in carpentry, housework, gardening, etc., in which they received some slight instruction." (21—155)

General Armstrong saw, also, the great need of young colored people who could become teachers of their race. The comprehensiveness of his plan for an èducational institution at Hampton is revealed by a quotation from one of his later writings:

> The thing to be done was clear: to train selected Negro youths who should go out and teach and lead their people, first by example, by getting land and homes; to give them not a dollar that they could earn for themselves; to teach respect for labor, to replace stupid drudgery with skilled hands, and to those ends to build up an industrial system for the sake not only of self-support and intelligent labor, but also for the sake of character. (21—157)

Armstrong knew of the failures of the earlier manual labor schools (cf. 55) in their efforts to combine labor and study but he believed that it could and should be done for the Negroes. He believed, too, that the colored boys from the plantations were unfit for many forms of industrial work and that farming should be the chief occupation taught in a school for the Negroes.

Early in the year 1867 he wrote to the American Missionary Association suggesting that it purchase an estate of 159 acres fronting on Hampton River which had just come on the market. The Association acted "promptly and cheerfully" and what is now the great Hampton Normal and Industrial Institute came into being with General Armstrong as its principal. The American Missionary Association sent two carpenters to put up temporary buildings—cheap wooden structures, "the material being taken from the old hospital barracks." (21—162) The school opened on April 1, 1868, with General Armstrong, one teacher, one matron and fifteen boarding pupils. By April 26th the number of pupils had doubled; the school continued to grow rapidly. "The pupils worked in squads, one squad working two days in the week and studying the other four; they were paid for their work, not in cash, but in credit on the books of the school." The aim of this plan was to provide continuous laborers for the farm without that daily interruption of study which had proven unsatisfactory in many manual labor schools. Students were paid 8 cents an hour. "Board was $10 a month, of which half, or in case of extreme want, the whole, could be worked out. Those who worked out the entire sum were allowed to attend school at night, thus fitting themselves mentally at the same time as financially to enter the day school later. If a student wished to earn his way by working at some industry other than what was provided by the school, he was allowed to do so. No student was expected to pay for his tuition, a burden which would have been too great for any Negro to carry in those early times." (21—168)

From time to time new industries were added as needed for the efficient maintenance of the institution. Brick-making was started in 1869. A blacksmith shop for the use of the farm was

opened in 1871. A shoemaking department was started in 1872. The Institute catalog of 1874–75 reveals the assignments for work to be as follows:

Boys		*Girls*	
Farm	90	Industrial room	72
Printing Office	3	Housework	6
Painters	3	No work has been found for	..
Carpenters	4	Day scholars	11
Coopers	3		89
Shoemakers	3		
Janitors	4		
Office duty	2		
Mail carriers	2		
Waiters	11		
Employed by teachers	2		
Police and general duty	6		
Day scholars on orderly duty	19		
Teaching	2		
	154		

A few years later, 1882, a saw-mill was added to the industries, then in 1884 a machine shop. The development of the industrial work continued until the trade school of Hampton Institute has become one of the leading trades schools of the entire nation, and the model from which others have been patterned, especially those for the Negroes and Indians.

64. **Industrial Reform Schools in America.** Following shortly after the first industrial schools for orphans and other poor children in the United States came the early industrial reformatories for juvenile offenders. The first of these was the New York House of Refuge on Randall's Island, incorporated in 1824 for the "reformation of juvenile delinquents." This was followed in 1827 by the House of Reformation for Juvenile Offenders in Boston and in 1828 by the House of Refuge in Philadelphia. (4—726) The aim of such institutions, as given in an opinion handed down by the Supreme Court of Pennsylvania in a case involving the Philadelphia House of Refuge in the year 1828, was "reformation, by training its inmates to industry, imbuing their minds with the principles of morality and religion, by furnishing them with the means to earn a

living, and, above all, by separating them from the corrupting influence of improper associates." (22—13)

The official viewpoint of that time concerning the value of industrial labor in prisons and reformatories is reflected in the fourth report of the Prison Discipline Society:

> The county prisons to a vast extent, throughout the United States, are *not* places of labor; and for this among other reasons are places of extreme profligacy in regard to gambling, profane swearing, Sabbath breaking, and other nameless offences.
>
> In the reformed prisons where labor has been systematically introduced, and industriously prosecuted, under a vigilant inspection, a vast amount of moral evil has been prevented. This is delightfully illustrated at the prisons in Auburn, Sing Sing, and Weathersfield, and at the House of Refuge in New York, Philadelphia and Boston. Even in the same prison, where some of the men have been furnished with labor and others not, it is the testimony of the officers that they can prevent evil more easily among one hundred men who are busily employed, than among ten who have nothing to do. (22—116)

The report also calls attention to the financial returns from the labor of the inmates of such institutions as helping to pay the cost of maintenance. For example, during one year the boys at the House of Refuge in New York made

Brass nails	15,600,000
Cane chair bottoms	10,884
Willow work gallon demijohns	2,150
Brushes of various kinds	2,060
Weight of bristles assorted and combed	2,000
Pounds of bristles picked	500
Weight of bristles washed and bleached	1,000
Soap and candle boxes for shipping	18,600
Shoes of various kinds	2,450
Suits of jackets and trousers for winter	150
Pairs of trousers for summer	400
Caps	50

(23—II, 117)

In 1829 the time schedule for the House of Reformation for Juvenile Offenders in Boston was

6:00 to 6:45 A.M.	Recreation	2:00 to 4:45	Labor
6:45 to 7:30	Religious exercises	4:45 to 5:30	Recreation
7:30 to 8:00	Breakfast	5:30 to 6:00	Supper
8:00 to 10:00	Instruction in school	6:00 to 8:00	Instruction in school
10:00 to 12:45	Labor	8:00 to 8:30	Religious exercises
12:45 to 1:30	Recreation	8:30 P.M. to 6:00 A.M.	Sleep. (23-II, 117)
1:30 to 2:00	Dinner		

These early industrial reformatories for juveniles were doubtless an improvement upon the still earlier prisons but they were "workhouses" where the "work was slavish" and "the child was conscious of no advantage to himself." (22—19) The occupation he learned, as a rule, could not be called a trade and it was not the one he was likely to follow as a means of livelihood after leaving the institution.

After the establishment of the three houses of refuge referred to above the movement lagged for nearly twenty years. (22—11) Then, for the next thirty years institutions were established in rapid succession. These new schools, however, were generally of a different type.

"They broke away from the prison-like buildings and the prison discipline" of the earlier institutions. They abandoned "the idea of retributive punishment" and sought to "create and establish right character in delinquent children." (24—11) This new type of reform school opened the way for more and much better instruction in manual and industrial work. In this connection it is well to recall that at the beginning of this new period, about 1848, the Manual Labor Movement had spent its force in theological seminaries. (cf. 55) Some of the enthusiasm that was centered on manual labor in the seminaries was now directed toward industrial work in juvenile reformatories.

The kinds of work done by the children in the reformatories varied with needs of the individual institution and the local industrial conditions. The time allotted to labor as compared with that devoted to study also varied. For example, in 1856, two of the older type of institutions, the House of Refuge on Randall's Island and the House of Refuge at Rochester, N. Y., were devoting 7 hours a day to labor and 3½ hours to school work, while two of the newer type, the State Reform School for Boys at Westborough, Mass., and the State Reform School at West Meriden, Conn., were giving only 6 hours to labor and 4 or 4½ to school work. (25—I, 373, 380, 451) At that time the practice of indenturing boys on leaving the schools was common. Of those leaving the House of Refuge in Rochester in 1855, 40 were indentured, 5 were sent to sea on whaling voy-

ages, and 50 were discharged to parents and guardians. (25—451)

In 1867 E. C. Wines made a report to the legislature of New York in the appendix of which he gave the results of a survey of juvenile reformatories made by the questionnaire method. A part of this survey had to do with the teaching of trades. Concerning the replies to the question, "Are they all taught a trade?" he says, "The replies are all substantially the same. It is not an object to teach the children a trade, but they all have regular work, and are trained to habits of industry. The girls are instructed in household labor and in plain sewing. Some boys acquire a trade." (26—429) Concerning the question, "What are the different handicrafts carried on in the institution?" he makes this reply:

"*Connecticut.*—Mostly on cane seat chairs; about 20 on the farm and 30 in the sewing shop.

Illinois.—Shoemaking, tailoring, basket-making, cane seating chairs and farming.

Maine.—Shoemaking, chair seating, sewing and knitting, farming, and brick and tile making.

Maryland.—Shoemaking, combing and assorting bristles, tailoring, box making, farming and gardening.

Massachusetts.—State Reform School: chair-seating, seating, sewing and knitting, washing, domestic work, shoemaking, farming and gardening. They are taught to be industrious, and prepared to learn a trade. Nautical Branch.—Practical seamanship. Girls' School.—They are taught housework, braiding and plain sewing.

Michigan—Tailoring, shoemaking, matting and weaving chair seats, farming, gardening, and braiding palm-leaf hats.

Missouri.—At present shoemaking, to a limited extent tailoring, and knitting stockings for the use of the institution. The cooking, washing, ironing, etc., are done by inmates. A limited number are also employed in gardening.

Ohio.—All the boys not employed in performing the necessary work of the institution, are engaged in manufacturing shoes. The females are employed in the laundry, sewing room, kitchen, knitting room, hall and chamber work.

Pennsylvania.—Brush making, shoemaking, boxmaking, chair making, blacksmithing, the manufacture of umbrella wires, match boxes, and shoes for the inmates of both the white and colored departments.

Rhode Island.—Shoemaking.

Wisconsin.—Shoemaking and tailoring. (26—429, 430)

The outstanding reason why the boys were not very generally taught trades was that a large proportion of them were below fourteen years of age upon entrance to the reform schools.

SOURCE MATERIAL VII, A

Establishment of Pauper Schools

By James Phillips Kay, Esq., Assistant Poor-Law Commissioner
From *Journal of the Statistical Society of London*, 1839

It may be important to consider what is the usual training of an agricultural labourer's child under his father's roof, and in what respects it may be proper to imitate that training in educating the children who are necessarily maintained in workhouses.

The child of a labourer reared beneath its parent's roof is early trained to labour. At a very tender age the lad follows his father a-field; he rides the horses home or to water; he is employed to scare the crows from the recently sown corn; by-and-by, he assists his father when thrashing in the barn; he drives the plough-team. At hay-time the whole family, both boys and girls, find constant work; at harvest they are very early employed in gleaning, and at seed-time they work at wheat-dropping. The boys thus become gradually initiated in the duties of husbandry, until, assisting more or less in ploughing, harrowing, thrashing, milking, and the charge of horses, they take their station in some department of husbandry, commonly first as team-men; and afterwards are gradually employed in those departments of labour requiring greater skill, and implying more confidence in their integrity and industry. This is the industrial training of a labourer's boy when resident under his father's roof.

The girls do much work a-field. I have already alluded to their services in the corn and hay harvests, and at wheat-setting. They are also employed in carrying their father's provisions to the field, in stone-gathering, in hoeing, in turnip-topping, and other agricultural work which is not deemed too laborious to be performed by a female in the rural districts. In the labourer's own household (the more appropriate scene of female exertion and care) the girls learn to scour the floors, to wash the linen, to sew and knit, and to clean the few utensils which their father may possess; to assist their mother in baking or in cooking their frugal meal, or in nursing a younger child. The girls thus acquire a knowledge of domestic duties, and become fitted (too frequently it is to be feared not so fully as could be wished) to perform the domestic duties, and to encounter the domestic cares of a labourer's household.

Little can be said respecting the training which the children of labourers receive in useful learning suited to their station in life, because few schools exist in the rural districts, and the instruction in many of those which do exist is meagre. Neither can it be said that the religious instruction of the labourer's family is always satisfactorily promoted by the existence of customs such as prevail in the households of the Scottish peasantry; but the domestic and social sympathies are awakened and cherished by mingling with their father's family, and associating with their neighbors.

But if an orphan, bastard, or deserted child, or the child of an idiot, helpless cripple, felon, or widow be maintained in the Union workhouse from the age of three to the age of fourteen, when he ought to go to work, one of two results must ensue.

1st. Either the boy or girl must at that period have acquired such habits of industry, such skill in some useful art, and such correct moral habits, as to render his services desirable, in which case he will go to service, and his dependence will cease; or 2ndly, by neglect, or by the adoption of a system of training not calculated to prepare them for the discharge of the practical duties of their station in life, the pauper children maintained in workhouses are *not qualified for service*, and then it will become necessary to adopt the old expedient for the removal of the burthen created by the absence of a correct system of moral and industrial training, viz.:—*to apprentice the children* to a trade or calling, by paying a premium to some artisan to instruct them in an art by which they may earn their subsistence. (15—I, 16, 17)

I will now proceed to consider, in the first place, what methods should be adopted for the *industrial training* of the children.

The great object to be kept in view in regulating any school for the instruction of the children of the labouring class, is the rearing of hardy and intelligent working men, whose character and habits shall afford the largest amount of security to the property and order of the community. Not only has the training of the children of labourers hitherto been defective, both in the methods of instruction pursued, and because it has been confined within the most meagre limits, but because it has failed to inculcate the great practical lesson for those whose sole dependence for their living is on the labour of their hands, by early habituating them to patient and skilful industry.

An orphan or deserted child, educated from infancy to the age of 12 or 14, in a workhouse, if taught reading, writing, and arithmetic only, is generally unfitted for earning his livelihood by labour. Under such a system he would never have been "set to work." He would, therefore, have acquired no skill; he would be effeminate; and, what is worse, the habits of industry, which he might have acquired had he been so fortunate as to live beneath the roof of a frugal and industrious father, would be wanting. He would also be deficient in that manual dexterity by which a well-trained labourer is enabled to increase the comfort of his own household, without an expenditure of his earnings.

The county-school should be surrounded by a garden of six, eight, or ten acres, in which the system of instruction in gardening adopted in Lady Byron's school at Ealing, in the school of the Children's Friend Society at Hackney Wick, and also by Lord King and others, as originally proposed by De Fellenberg on the Continent, ought to be pursued. The schoolmaster should, at the appointed hours, accompany the boys into the garden, and superintend their instruction in digging, hoeing, planting, and careful gardening. They will thus be initiated in employment closely resembling rural labour, which, if it were only followed by the useful result of enabling them in after-life to cultivate their cottage allotment with greater skill, would be a desirable acquisition. The schoolmaster should be provided with some simple elementary works on gardening, from which some of the oldest boys should read extracts daily to the school, after which the master should ask such questions and make such comments as he may deem desirable to awaken and sustain the attention of the children.

The plans pursued at Ealing Grove School, and some other similar establishments, are described by Mr. Duppa, in a tract which has obtained an

extensive circulation. But these plans would require considerable modification in a school containing pauper children. It would not be possible to afford the stimulus of wages for labour on land not allotted to the children, nor could the profits of the allotments be given to children maintained at the expense of the rate-payers in the county-school; but it would be desirable that the land should be divided into allotments among those boys who had acquired a certain amount of skill in gardening, and that a separate account should be kept for each allotment of the quantities and value of seeds and manure furnished, and of the crops produced, and their value; and the accounts thus rendered should, from time to time, be examined and certified by the master, and compared before the school. When an orphan or deserted child was about to leave the school to go into service, the account of his labour in the garden or elsewhere should be carefully examined before certifying his diligence, and the produce of his allotments and work might be considered in reference to the nature of the outfit granted him on leaving the establishment.

The produce of the children's labour would have a certain value. Thus, for example, the establishment would be altogether supplied with vegetables from the garden cultivated by the boys. It is therefore desirable, before proceeding further, to remark, that the object of setting the children to work is, *not to make a profit of their labour, but to accustom them to patient application to such appropriate work as will be most likely to fit them for the discharge of the duties of that station which they will probably fill in after-life.*

I now proceed to consider what other employment could be usefully taught the child of an agricultural labourer.

Several of the workhouse schools are supplied with carpenter's tools and rough boards. The boys make their wheelbarrows; erect any small outhouses which may be required; fit up their tool-houses; make the desks, forms, and fit up the closets of the school; and do any other rough carpenter's work which may be required in the establishment. They are thus prepared to do any work of a similar description which might be required in ordinary farm service. A husbandman who could weatherboard a barn would be preferred by a farmer, and would probably obtain superior wages. The premises selected by the Children's Friend Society for their industrial school at Hackney Wick were, when first occupied, in an almost ruinous condition. These dilapidations have been repaired, the breaches have been built up, and the woodwork renewed, almost solely by the labour of the boys. When I visited the school they were engaged in erecting a new building. At Lady Byron's School at Ealing, some outbuildings, schoolhouses, etc., have been erected solely by the labour of the boys. The children have thus acquired a knowledge of the way to make mortar, to set a brick, to saw and plane a piece of wood, to drive a nail in a workmanlike manner; all which skill cannot fail to be useful to them as farm servants, or in repairing dilapidations in their own cottages.

The guardians of certain of the rural unions consider it desirable that children should learn to make a hurdle and osier or a "frail" basket, or a net; and such arts may be taught by procuring the attendance of an artisan during a certain portion of a day, twice or thrice weekly until the schoolmaster and the children have acquired sufficient skill to pursue their employment without such assistance.

Some other employments might be taught with a view to enable the future agricultural labourer to contribute to the comfort of his household without an expenditure of his earnings. Thus the whole of the boys' clothes of the establishment should be patched and mended by them, and a certain portion of their clothes at least might be made by the boys, even if it were considered undesirable to rear any of them to the employment of a tailor. In the same way, the whole of the shoes worn in the house should be mended by the boys; and if it were considered desirable to train certain of the boys to earn their livelihood as shoemakers, perhaps a large portion, if not all the shoes used, might be made by them. Neither of these trades should, however, be further pursued than, upon a careful consideration, may be thought desirable; first, to train a few children as tailors or shoemakers; or, secondly, to give the rest of the children sufficient skill to contribute, without expense, to the comfort of their households. The hope of profit ought not to induce the guardians to allow these employments to be pursued to the exclusion of others more appropriate to the future situation of an agricultural labourer.

The boys are also employed in the workhouses in plating straw hats, making straw mattresses, whitewashing the walls whenever necessary, in cleaning out their rooms, lighting the fires, etc., and at the weekly meeting of the guardians, the oldest lads are most usefully employed in receiving and taking charge of the horses, when they are taught to wipe and clean the bridles and saddles, to take them off and put them on, to clean whatever gigs or chaises are in the coach-house, and afterwards to clean the stables, make up the bedding for other horses, etc. They are on such occasions required to manifest to the guardians the habits of prompt attention, which the master is directed to inculcate.

The employments adopted in similar establishments in the manufacturing districts would, of course, bear a relation to the employment of the neighbourhood, similar to that which the above-mentioned occupations have to the pursuits of an agricultural labourer.

The domestic management of the establishment will afford considerable facility for the industrial instruction of the girls. The whole of the domestic arrangements should be made subservient to the training of the girls in all the arts of household service. For this purpose, they should be divided into classes, which should be successively employed during such periods as may be found convenient in every part of the household duty. Thus, one class of girls would be engaged in scouring the floors, lighting the fires, making the beds in the several wards; another class would be employed in the wash-house in their turn, where all the clothes of the establishment should be washed; a third class would, in rotation, work in the laundry; and among the officers of the establishment it would be desirable to have a laundress, to superintend the girls employed in washing, ironing, and making up the clothes.

A separate establishment for children would enable the Poor Law Commissioners to regulate the dietary used in the county-school in such a way as to assist the schoolmistress in affording the children valuable instruction in such frugal cookery as it would be desirable that the wife of a labouring man should know. Books treating on this subject should be provided for the use of the school, and the reading and explanation of them should form a part of its regular routine; while the oldest girls should be employed in rotation in

the kitchen, under the superintendence of the schoolmistress, in learning to cook such food as the wages of a labourer could ordinarily supply, so as to ensure the most economical management of his means. The whole of the other duties of the kitchen and scullery should likewise be performed by the girls. A portion of every day would of course be devoted to the ordinary instruction in knitting and sewing, but the children should likewise be taught to cut out and make their clothes. No part of service is of greater importance than a proper attendance on the sick; and cases may occur in the school where the older girls may be employed, not to supersede, but to aid the proper nurses in attendance on the sick, under the direction of the medical officer. From time to time the girls might be employed in weeding and hoeing in the garden, as a means of instructing them in the out-door employments of females in rural districts. They might also learn to wait upon the schoolmasters and schoolmistresses.

The success which has attended the efforts of the Children's Friend Society to reclaim juvenile offenders, by the adoption of a similar system of industrial training in their establishments at the Brenton Asylum, Hackney Wick, and the Victoria Asylum, Chiswick, would warrant its adoption in a county-school, or throughout the ordinary Union workhouses of England and Wales; and without such instruction it is evident that whatever other system of training is adopted, the education of the pauper children can afford no effectual guarantee for their future independent subsistence by the wages of industry. (15—I, 16–26)

SOURCE MATERIAL VII, B

Needlework as reported by Government Inspectors of Schools in England

It has often struck me, and the observation has been frequently made to me by those who are conversant with the subject, that the instruction given in it (needlework) is very unmethodical and clumsy. As much time seems to be lost in its elementary parts as in learning the alphabet on the old method. A needle and thread and a small piece of calico are put into a little girl's hand, and she is often left much at liberty to prick her fingers or make holes in the calico as she pleases. Little positive instruction is given to her. Bad habits are formed, habits of inattention, unreadiness, and tardiness in her work. Nor is it in general the case that the mistress is not qualified to give instruction, or that she herself is an unskilled needlewoman, but the work is allowed to proceed for some time without methodical and constant teaching. When the child has wasted months on that which might have been acquired in as many days, and taught herself in a clumsy way that which ought to have been imparted skilfully, then some attention is paid to her, and some trouble is taken that she may, in a great measure, unlearn what she has acquired. Yet there are some schools where this branch of industrial instruction is rightly undertaken from its first elements. (From report of 1850) (14—111)

A steady progression is observed from the simplest to the more difficult operations of fixing and stitching, of darning and marking; but it seldom appeared that even the eldest classes received specific instruction in the economy of materials, to the extent contemplated at the central school. The order, assiduity, and progress universally exhibited in this department, make

me hesitate to criticise proceedings in a mystery of which I know so little; but it has always struck me that a little waste paper, in these times so abundant, might very beneficially be cut up in each school in the course of the year, in illustrating the practical geometry of "cutting out," in the top sewing class. Knitting is still taught in most of the schools, being yet much practised in the remoter parts of the country; and in proportion as a school is feeble and neglected, did I find "fancy-work" to abound in it, however wretched the character of the neighbourhood; for the teacher, under such circumstances, seeks to please only the children and their parents, who are often exceedingly fond of the little meretricious cleverness thus exhibited. . . . In the girls' schools generally, the children are allowed to sew for their parents, one or more days in every week, but the rest of their time they are employed on the school account. Hence sometimes arises at the end of the year, a trifling profit towards its expenses, which, however, is very dearly earned in the unfrequent instances in which the making of linen takes precedence of the making of women; or in other words, whenever the completeness of the course in this invaluable branch of domestic education is at all sacrificed to expertness, merely in some one or two operations, obtained by a division of labour more worthy of a factory than of a school. . . . A good course of instruction in domestic economy; the economy of food, fire, clothing, health, and cleanliness, is exceedingly wanting in these schools, and would prove the best possible antidote against indolence, and vanity, while it would offer occasion for much healthful exercise of all the faculties of the mind. A proper manual of such a course has yet to be provided; but I think it would very gladly be adopted when once drawn out, and made familiar to the teachers; for it is not to be supposed that the ladies who are most sensible of the danger to which I refer can object that their *protegees* should be qualified to exercise, in all gentleness, as much and as good an influence as possible upon their future companions in life, to say nothing of the qualifications for domestic service which they would thus acquire. (From report of 1847) (14—111, 112)

The children in the higher classes are provided with lapbags, made of brown holland. . . . The monitor of each desk is furnished with a pair of scissors, thread-paper, needle-case, and a bag large enough to contain all the implements that belong to her desk. They are also supplied with a few thimbles and needles, for which they are responsible to the platform monitor. The children in the lower classes use coloured cotton for the class work, as it renders the stitches more conspicuous, and consequently facilitates general inspection. It also excites an interest, as the promise of a choice of some pretty colour is a strong inducement to a child to perform her work neatly. . . . For the details of the instruction in each class, I must refer to the "Manual." The first class is for hemming, in two divisions, one composed of those who have not learned to fix a hem, and who are taught on waste paper, as being less expensive than linen or cotton, and answering the purpose just as well; and a second, in which they practise hemming on small pieces of calico. The second class, also in two divisions, is for sewing and felling, and running and felling; the first division learning to fix their work in paper, and the second to execute it. The third class is for drawing threads and stitching; the fourth, for gathering and fixing gathers; the fifth, for button-

holes; the sixth, for making buttons and sewing them on; the seventh, for herring-bone stitching; the eighth, for darning; the ninth, for making tucks, and whipping; and the tenth, for marking. The eleventh is the finishing class. There is at present no knitting or netting class; and fancy work is expressly excluded and discouraged.

"As it is highly desirable that the children, as soon as they have learned to work, should be employed in something useful, this class comprises the girls who have passed through the preceding, and are here engaged in making and completing garments. The children in this class are taught economy in purchasing, cutting out, and repairing various articles of wearing apparel; they are made acquainted with the waste occasioned by the want of proper consideration and exactness in domestic arrangements, and the miseries frequently produced by mismanagement and inattention. In order to impress upon their minds this useful branch of female instruction, they are interrogated, in various ways, on the common concerns of life. When the teacher proposes a question, she waits until each child in the class has had an opportunity of returning an answer, according to the knowledge she possesses. She then comments upon each of these answers in a way that will enable the *children* to decide which is the most suitable course. To assist the teachers in these exercises, they are furnished with a few examples of questions and answers, which they may carry out to a much greater extent."* These also will be found in the "Manual," together with engraved patterns for cutting out the commonest garments. The highest industrial section of the school forms in fact a class for collective teaching of the most practical and improving kind, including as many ideas on household management generally as can be conveyed. Specimens of needlework, made up in portfolios for the use of teachers, and arranged in the order of the above classes, are sold at the Society's Depository; and the beautiful patterns of every variety of garment, made up in tissue paper by the finishing class against the time of the annual meeting, are quite little works of art. (From report of 1847) (14—112-114)

The rule (of the . . . School) is, that the girls shall be taught the various stitches required in plain needlework, separately, on small pieces of calico, linen, etc., before they are permitted to work for the school. They are taught the stitches in the order specified in the book "Progress in Needlework," and learn each perfectly before they go on to the next: the last specimen of each stitch is kept in a paper packet marked with the girl's name. (From report of 1850) (14—114)

Among the most interesting features of the girls' school is the needlework. The elder girls are taught not only to work, but, by paper patterns, to cut out work for themselves; and the dresses of the first class, on the day of my examination, were many of them thus cut out, and all made by themselves. There seems to be no reason why the economical cutting out of work should not thus enter, as a part, into the ordinary instruction in needlework in our schools. The cost of paper for patterns would be little. The fitting of different articles of clothing to the children of the school would supply an inexhaustible variety of subjects for patterns; and for such an object the

*The Quotations are from the British and Foreign School Society's Manual of the System of Needlework, p. 44-45.

school might well afford a good many failures. . . . When a girl has cut out for herself the dress she has made, she has associated her labour, in a natural relation, with the exercise of her judgment; she has taken one step towards her emancipation from a state of pupilage. (From report of 1848) (14—114)

SOURCE MATERIAL VII, c

On Girls' Industrial Training

By Rev. J. P. Norris, Inspector of Church Schools in Cheshire, Shropshire and Staffordshire

From *Transactions of the National Association for the Promotion of Social Science*, London, 1859

Our present course of school training certainly does tend to give girls a distaste for housework. It is too bookish, too sedentary. How can this be remedied?

My answer is a simple one; it *has been* remedied in about a dozen schools in the three counties which form my district, and *might be* in nearly all of them. About a dozen day schools (besides the usual afternoon of needlework, of which I shall have more to say by and bye) have engrafted industrial housework into the school routine, and the effect, in every case where it has been judiciously done, has been that the girls of that school have stayed longer, and much more generally sought domestic service, and have found excellent places. . . .

I shall content myself with giving a few of the most valuable results of our experience.

1. *Industrial work must be real necessary work, not a plaything.*
2. *The principal teacher of the school must herself take a hearty interest in it.*
3. *It must be made attractive to the girls.*
4. *Care must be taken to put them in the way of obtaining good places when they leave school.*

I will now show briefly how these rules may best be carried out.

Except in special cases, where there happens to be a demand for some particular product of female industry, opportunity for industrial training will best be supplied by a model home in connexion with the school. The mistress's house is obviously the nucleus of such a home. The addition of a couple of bedrooms for boarders, and a corresponding enlargement of the kitchen, offices, etc., would at once supply a routine of housework sufficient to occupy a dozen of the elder schoolgirls for six or eight hours in the week.

They should divide the work among them, some in turn being in the kitchen, some doing housemaid's work, some washing, some baking, some marketing. The boarders (who will probably be the daughters of small farmers or tradespeople,—one or two of them, it may be, pupil teachers) should certainly take part with the day-scholars in the work. This will help to make it the fashion among the day-scholars. After the first outlay (toward which the Government would make a liberal grant), the plan need not be an expensive one. The payments of the boarders will make it almost self-supporting.

Everything is purposely on a small and economical scale: I regard this as most important; industrial apparatus may very easily be too complete. The

kitchen, laundry, and bakehouse should be good of their kind, but of the cottage kind, so to speak.

The success of the scheme will entirely depend on the measure in which it fulfils the four conditions above-mentioned.

The first is clearly fulfilled in the plan which I have sketched. There is the little household; its food must be cooked, its beds must be made, its linen must be washed.

The second condition is more likely to be fulfilled in future years than heretofore. The late minute of the Committee of Council will oblige much more attention than formerly to be paid to domestic economy in our Training Colleges. But anyone proposing to organize such a school should be especially careful to select a mistress who has a taste for housework. The actual labour of superintendence may be undertaken by a paid assistant, but the principal teacher must animate and give tone to the whole thing. If possible, the industrial superintendent should be the mother or the aunt of the schoolmistress.

In order to fulfil the third condition,—render the work attractive to the girls,—the industrial girls might be distinguished by a rosette on the shoulder or in some other way; one meal a day might be given to them, according to the plan so admirably carried out by Mr. Hawtrey at St. Mark's School, Windsor, and at Cafesthome, in Cheshire, eight or nine years ago; or a complete suit of underclothing, made in the school, might annually be given to each day-scholar so employed; or there might be a school feast every year specially for the industrial scholars, as at Lawton and Acton Schools in Cheshire; to which those who had gone into service should be invited to return. The good fruits of the training, as seen in these former scholars, returning once a year, with happy, prosperous looks, to their old school, would have much weight with the children and with their parents.

And this leads me to the last point. The school must be a servant's registration office for the neighborhood. Some trouble will be needed at first to push the girls into good places, but as soon as the school has once obtained a name for training servants, all experience shows that the difficulty will be rather to meet the numerous demands made upon it. It is by active attention to this last point that school managers have in my district overcome their greatest difficulty, the opposition of the parents.

Here undoubtedly lies the most serious obstacle to the introduction of any scheme of industrial training. The parents can seldom be persuaded to set any value on it. They say they can teach such things at home, and they send their children to school to be made into scholars. Now, I have, during the last few months, taken especial pains in different parts of my district to ascertain how much industrial training the girls receive at home. In few respects does one part of the country differ from another more than in this. In some parts, where people have small farms of their own, with two or three cows on each, the home offers far better opportunities for the industrial training of the girl than any school can supply. The same applies to many homes where the mother keeps a small shop. Here, then, the plea of the parent is reasonable and just. And in these cases I should strongly advise a half-time scheme for girls above eleven years of age, so that they should make themselves useful at home one-half the day and attend school the other half; or failing this,

at all events leave of absence on the washing-day or the market-day. In other parts of the country—for instance, factory districts, mining districts, or highly farmed districts, where the land is let in large holdings—the parents' plea that they can teach household work at home merely proceeds from their own low standard and ignorance in the matter.

In such cases the establishment of a model-house, such as I have described, in connexion with the school is most desirable. To overcome the foolish objections of the parents is the great difficulty. But this difficulty will lessen every year, when they begin to see the children like it, and are helped forward in the world by it: and the gift of clothes or food at the outset will go far to reconcile them to it. . . .

Here, then, I close what I have to say about industrial training; my plan for carrying it out in connexion with a national girls' school is very much what I sketched in my Report to the Committee of Council in 1853. It has been partially carried out in many places, and with excellent effect. The value of the training consists not so much in the instruction given in any specific art, as for example, the art of laundry work—for this the girls in our schools are for the most part too young—but rather in the cultivation of what may be termed the homely instincts and the homely virtues of the girl, alongside of her book learning. We not only want her to be the steady, well-principled, intelligent girl described in the earlier portion of this paper, but we wish her also to be active and ready, with a quick eye for what is wrong in the house, and a quick hand to put it right, helpful in whatever is going on, sensible and trustworthy in matters of household responsibility, and rejoicing to do her work well, whatever it is. . . .

I have purposely left to the last what I have to say about needlework. . . . In the last few years the improvement in needlework has been so great that I feel very sure all complaint on this head in respect to the annual grant schools of my district will soon cease.

The plan I find to work best is to classify the school afresh in the afternoon, according to the girls' proficiency in needlework. In the best schools the girls are taught to turn down a hem as soon as they take a needle in hand and so throughout they learn the placing or fixing along with each new sort of stitching. The first class is the cutting-out class. No girl is promoted from one class into the one above until she have produced a sampler of all the kinds of work proper to her former class. Her progress is recorded in a book kept for the purpose.

The difficulty of providing properly graduated work for the girls is overcome (where there is no regular supply of work from the school committee) by purchasing cheap stuffs and cottons at wholesale prices, and making these up in the school into articles of clothing, distributing the several parts of the work according to the capability of the girls. These articles of clothing are either made to order and paid for by instalments, as they are made up, by the children or their parents; or they are disposed of at a sort of auction on the occasion of the school feast, or otherwise. Certain afternoons in the week are set apart for such work as the children may bring with them from their homes. But this home-work seldom affords such good practice to the girls as work selected by the mistress, suitable to each one's proficiency, and cut out for them in the school.

I find the greatest possible difference of standard in different schools in respect to needlework. It may serve as some sort of guide if I state here the average standard of attainment in needlework reached in the better sort of schools.

The first class are usually able to show the frocks or shirts which they have cut out and made; in some instance sa pattern has been given them, in others the cutting out has been done by rule. One-fourth of the school, sometimes one-third, are able to make a shirtsleeve (cut out for some of them) placing the band on the gathers themselves, stitching a rounded waistband, and making the buttonhole. In our prize examinations we expect all grls above eleven years old to do this,—the work being done under the examiner's eye. In many schools one-half can knit a stocking without any help, and darn a hole. (13—371–374)

SOURCE MATERIAL VII, D

The Education of Factory Children in Germany

From *The Social Condition and Education of the People in England and Europe* by Joseph Kay, 1850

The laws relating to the factory children date only from 1839, so that no notice of them whatever will be found in M. Cousin's report. They are as follows:

"No child may be employed in any manufactory, or in any mining or building operations, before it has attained the age of *nine* years.

"No child, which has not received three years' regular jinstruction in a school, and has not obtained the certificate of a school-committee, that it can read its mother tongue fluently, and also write it tolerably well, may be employed in any of the above-mentioned ways, before it has completed its sixteenth year.

"An exception to this latter rule is only allowed in those cases, where the manufacturers provide for the education of the factory children, by erecting and maintaining factory schools."

If a manufacturer will establish a school in connection with his manufactory, and engage a properly educated teacher, he is then allowed to employ any children of nine years of age, whether they have obtained a certificate or not, on condition, however, that these children attend the school four evenings in every week, as well as two hours every Sunday morning, until they have obtained a certificate of proficiency in their studies.

The "Schulrath," or educational minister in the county court, decides whether the factory school is so satisfactorily managed, as to entitle the manufacturer to this privilege. This minister also regulates the hours which must be devoted weekly to the instruction of the factory children.

"Young people, under sixteen years of age, may not be employed in manufacturing establishments more than ten hours a day."

The civil magistrates are, however, empowered, in some cases, to allow young people to work eleven hours a day, when an accident has happened, which obliges the manufacturer to make up for lost time, in order to accomplish a certain quantity of work before a given day. But these licenses cannot be granted for more, at the most, than four weeks at a time.

After the hours of labour have been regulated by the "Schulrath" and the manufacturer, the latter is obliged by law to take care that the factory children have, both in the mornings and in the afternoons, a quarter of an hour's exercise in the open air, and that at noon, they always have a good hour's relaxation from labour.

"*No young person, under sixteen years of age, may, in any case, or in any emergency, work more than eleven hours a day.*" The children of Christian parents, who have not been confirmed, may not work in the mills during the hours set apart by the religious minister, for the religious instruction, which he wishes to give them preparatory to their confirmation.

The manufacturers, who employ children in the mills, are obliged to lay before the magistrate a list, containing the names of all the children they employ, their respective ages, their places of abode, and the names of their parents. If any inspector or teacher reports to the civil magistrate, that any child under the legal age is being employed in the mills instead of being sent to school, or if the police report the infringement of any other of the above-mentioned regulations, the magistrate is empowered and obliged to punish the manufacturer by fines, which are increased in amount on every repetition of the offence.

I examined the actual state of things in Elberfeld, one of the most important of the manufacturing districts of Prussia, and I found these regulations most satisfactorily put in force. No children were allowed to work in the mills, before they had attained the age of nine years, and after this time, they were required to attend classes four evenings every week, conducted by the teachers of the day-schools; or, if their work was of such a nature as to prevent such attendance, then they were obliged to attend classes every Sunday morning for two hours; and this attendance was required to be continued, until the children could obtain a certificate from their teacher and religious minister, that they could read and write well, that they were well versed in Scripture history, and that they knew arithmetic sufficiently well to perform all the ordinary calculations, which would be required of them. As a check upon the parents and manufacturers, no child was allowed to labour in the mills, without having obtained a certificate, signed by its religious minister and its teacher, that it was attending one of these classes regularly. If the attendance was irregular, this certificate was immediately withdrawn, and the child was no longer allowed to continue working in the mills. But, from all I saw of these schools, and from what the teachers told me, I should say, they had no difficulty in enforcing attendance; and, so far from it being evident, that the parents were anxious to send their children into the mills, as soon as possible, I was astonished to find even the *daily* schools filled to overflowing, and that with children, many of whom were thirteen, fourteen, and fifteen years of age.

It is very easy for the traveller, who is merely passing through the *manufacturing* towns of the Rhine Provinces, to prove to himself, how anxious both the people and the government are to carry all these regulations into effect. Let him only take the trouble of wandering into the streets of such a town at a quarter to eight in the morning, or at a quarter to one in the afternoon, and he will find them alive with children of remarkably courteous and gentle appearance, all *very* neatly and cleanly dressed, each carrying a little bag con-

taining a slate and school books, and all hurrying along to school. Let him visit the same streets at any time during the school hours, and he will find an absence of young children, which, accustomed as he is to the alleys of our own towns, swarming with poor little creatures growing up in filth, and coarseness, and immorality, will be even more astonishing and delightful.

Before Prussia began in good earnest to promote the education of the people, it was thought there, as it is in England at the present day, that private charity and voluntary exertions would suffice, to supply the country with all the materials of education. In the early part of the eighteenth century the government enunciated, in formal edicts, that it was the first duty of a parish to educate its young. For nearly one hundred years, it trusted to the voluntary principle, and left the work in the hands of generous individuals; the result was what might have been expected, and what may be observed in England: the supply of the materials of education did not keep pace with the growth of the population. Prussia was little or no better provided with schools in 1815, than it had been in 1715; as to the teachers, they were poor, neglected, ignorant persons. Educated persons would not become teachers of the poor; and the poor were neither able nor willing to pay for the education of teachers for their children. A sufficient number of benevolent individuals could not be found to bear the whole expense of educating the nation; and even in those parishes, in which the benevolent part of the richer classes had managed to collect funds, sufficient for carrying on such a work for a year or two, it was found, that they were unable or unwilling, for any length of time, to bear alone such a great and ever-increasing burden.

After a long trial of this unfair voluntary system, which taxed charitable individuals in order to make up for the default of the selfish or careless, it was found, in 1815, as in England at the present day, that great numbers of parishes had no schools at all; that of the schools which were built, scarcely any were properly supplied with the necessary books and apparatus; that there were no good teachers in the country, and no means of educating any; and that the science of pedagogy had been totally neglected, and was universally misunderstood.

If, then, the people were to be educated,—and the French Revolution of 1789 had taught the Prussian government the necessity, of enlightening the poor and of improving their social condition,—it became but too evident, that the government must act as well as preach. In a word, the experience of one hundred years taught the Prussians, that it was necessary to *compel* the ignorant, slothful, and selfish members of the political body to assist the benevolent and patriotic, or that sufficient funds would never be found for educating the whole of the labouring classes. (18—II, 49–55)

SOURCE MATERIAL VII, E

Education of the Working Classes in Europe

From *Arts and Artisans at Home and Abroad* by Jelinger C. Symonds, Assistant Commissioner on the Handloom Inquiry, 1839

The education of the working classes abroad attracted much of my attention; and to the care afforded by foreign governments to its advancement do I attribute much of that greater contentment, and lesser criminality, which characterizes the artisans of the Continent, and which I particularly remarked in the manufacturing districts. Here education is left to the

philanthropy of individuals, or to the accidental wisdom of parents. Abroad it is deemed an element of government, essential to the comprehension of and obedience to the laws, and requisite alike to the interest of the state and to the welfare of the recipient.

In France the cost of education is provided for out of the municipal funds, which are by law authorized to support schools. In Belgium it is equally provided for by law. In Switzerland ignorance is punished; in Prussia and Bavaria education is compelled. In Austria, in addition to scholastic establishments, certificates of attendance are made passports to employment. Even in Russia, Alexander is establishing throughout his dominions, schools on the most approved system, and conducted by masters supplied from the normal schools of the civilized nations. In Egypt, under the superintendence of her singular Pacha, schools and universities on the most liberal scale are everywhere arising; in England, enlightened literary England, alone, does legislation reject Education as a handmaid of government! and in point of instruction of the population at large, she stands sixth among the nations of Europe!

In France a new law was passed in 1834, authorizing the appropriation of a portion of the municipal funds, to defraying educational expenses in each parish. It has resulted, that, as regards Infant schools, whilst in 1834 they existed only in a few of the largest towns, such as Paris, Lyon, Rouen, Nismes, etc., there are now no less than 172 communes, which expend 174,639 fr. yearly in their support; whilst the total number amounts to 262, containing altogether 29,514 children. A royal ordonnance of December 1837, appointed a commission to form laws for the general guidance of these schools, which has been accordingly ratified by the King last April; though the regulation of all the details are left to the discretion of the several parishes.

Adult schools have been likewise formed. The commission had here a more difficult task to execute. The necessary separation of the sexes, and again of each sex, the separation of the older from the younger, have rendered the progress of this most beneficial measure somewhat less speedy. However, 82,985 fr. are already devoted by 1547 communes to the aid of schools established in them; and the Government, in the fourth year of this enterprize, have the credit and satisfaction of rescuing each year 36,965 of the labouring classes from the infliction of ignorance.

The primary schools which have been formerly established, and which in 1830 contained 1,642,000 children, now contain 2,650,000.

The happiest results attend the increased intelligence of the people; and although the march of knowledge is not nearly so extensive, or so rapid as it may be rendered, yet each year, in the *recrutement militaire*, the number of those drawn for soldiers, who can neither write nor read, is greatly diminishing,—one-half of the whole number having formerly, and till 1837, been found ignorant.

The following are the results of a similar scrutiny, among a number of criminals promiscuously selected:

Neither knowing how to read or write	3,172
Knowing imperfectly	1,853
Knowing well	620
Superior education	248

Although elementary education is certainly progressing in France, real knowledge is far from being equally diffused; there is a very material deficiency in food for the popular mind in France. In almost all the countries where German is the national language, this is not the case. They have their Penny Magazines in Prussia, and cheap reprints of all foreign publications of European utility. France is, however, even behind us in this duty. (27—98–100)

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CHAPTER VIII

The Development of School Substitutes for Apprenticeship

65. **Apprenticeship and Schooling.** From the beginning of the Industrial Revolution, which came with the adoption of the factory system of production, men have been seeking something to take the place of the old-time apprenticeship. They have been trying to find satisfactory substitutes (1) for the apprenticeship method of teaching trade processes, (2) for the master's method of imparting the technical knowledge connected with a trade, and (3) for the general schooling and moral discipline that formerly was a part of apprenticeship training. In seeking these substitutes they have looked to the schools for assistance in all three directions. They have tried schools of various types and each type in various proportions and under various conditions of management and support. In some respects the schools, even in the period under consideration, were far more effective than was the old apprenticeship; in others they were not. Yet the schools continued to be looked to as furnishing the most reasonable substitute for the old-time apprenticeship which, as a whole, the world of industry had outgrown and to which it never would return.

As has been previously stated (cf. 11) apprenticeship was the chief educational institution for the middle-class youth of the Middle Ages. Up to the nineteenth century the majority of the people even in most of the progressive nations received very little or no schooling. Through apprenticeship the youth received non-technical as well as technical training. He was given a general preparation for life—moral, religious, and civic instruction—while learning the practice and the mysteries of his craft. (Source Material I, D) The mysteries were more or less different for each craft, but they included such recipes, rules and the applications of science, mathematics and art as

were required. In certain crafts, when the apprenticeship was for a period longer than seven years, or when the successful following of the craft required it, the apprenticeship agreement provided for certain schooling. In some of the gilds, as time went on, the masters were fined if they did not teach their apprentices to read and write. (Source Material I, c)

By the English Act of 1562, known as the Statute of Artificers, apprenticeship became a national system. "By this Act the whole gild system was remodeled, and trade regulation was made national instead of local." (1—16) (2—33–49) In 1601 the Poor Law was passed which made it lawful for church wardens and overseers to apprentice pauper children. The purpose of this type of apprenticeship was not so much to secure for these children instruction in a trade as it was to see that they were provided with board and clothing under a responsible guardian. Such children were usually bound out until they were 21 years of age. (1—20)

After the close of the seventeenth century parents sometimes stipulated that the apprentice be taught reading and writing. About 1715 stipulations that boys be allowed to attend "ye writing school" were frequent in Sheffield and sometimes found elsewhere in England. Mothers and guardians often valued the non-technical training—schooling and general training—more than the technical training.

In a good trade lay a lucrative career even for well-to-do boys, yet, in their case also, the general training given by apprenticeship was probably a consideration in their binding, for a fair number were fatherless lads; while high premiums were often paid to their masters in the late seventeenth and the eighteenth centuries, partly, no doubt, because masters in the lucrative trades could demand their fee, but probably in part to win the boys' entry into good homes. There was another class of apprentice in whose binding the general training and maintenance afforded by apprenticeship were the main considerations. The Justices of the Peace were empowered by various statutes to apprentice pauper children, and numbers were apprenticed from 1562 right on through the eighteenth century. No doubt where the master was a craftsman he taught his trade to the boys, but in the case of girls it is often expressly stated that they are to be trained only in matters "pertaining to a maid-servant" while the boys were frequently placed with men who had no trade to teach. (3—73)

66. **The Education of Apprentices in Colonial America.** In the English colonies in America apprenticeship retained the

essential characteristics of apprenticeship in the mother country, but its scope was broadened. It became "the most fundamental educational institution of the period." (1—22) In its development it had the advantage of being directly under the town and colony authorities, for there were no gilds or craft organizations as such in the colonies. (1—27)

As early as 1641 the General Court of the Colony of New Plymouth passed an Act adapting the English Poor Law of 1601 to the needs of the colony. Under this act a town through its Selectmen would apprentice the children of the poor "into families where they may be better brought up and provided for. This care included not only the maintenance but also the education of apprentices. In fact, all children whose education had been neglected were provided for by poor and apprenticeship legislation." (1—36)

In 1642 The Massachusetts Bay Colony passed a comprehensive apprenticeship law because there had been "great neglect in many parents and masters in training up their children in labor and learning and other employments which may be profitable to the Commonwealth." The colonists desired that the children have a "calling" and "ability to read and understand the principles of religion and the capital laws of the country." (1—37) "Labor" was emphasized in the educational procedure of the Colonial youth not merely because skilled craftsmen were "profitable to the Community" but also because of "the Puritan belief in the virtue of industry and the sin of idleness." (4—32)

A New Plymouth Order of 1671 required the officials of every town to "have a vigilant eye from time to time over their Brethren and Neighbors, to see that all Parents and Masters do duly Endeavor to teach their children and servants as they grow capable, so much learning as through the blessing of God they may attain, *at least to be able to read the Scriptures, and other profitable Books printed in the English Tongue and the knowledge of the capital Laws* . . . And further that all Parents and Masters do breed and bring up their children and apprentices in some honest lawful calling, labour or employment . . . That a fine of 10 shillings shall be

levied on the goods of negligent Parents and Masters. (1—37)

The Connecticut colony passed similar laws but added that "all masters of families do once a week at least catechise their children and servants in the grounds and principles of religion." (1—53)

Not all masters were capable of teaching their children and apprentices to read and write, yet according to the law the children must be given this elementary education. "Illiterate masters were obliged, therefore, to send their apprentices to persons who could teach them, which in most cases, meant that they sent the apprentices to schools." (1—41) So it came about that elementary schools appeared very early in the colonies, and in 1647 the General Court of Massachusetts ordered that every town of fifty householders should appoint one within their number as a school teacher who should be paid either by the parents and masters or "by the inhabitants in general." (1—42) Under this law many towns established free schools. (1—44)

These early schools taught reading and writing but soon there was a demand that ciphering be taught to the boys. When this subject was added, the schools taught reading, writing, and ciphering to "males" but only reading and writing, and sometimes only reading, to "females."

Concerning the industrial training of girls it should be made clear that the Puritan idea of the virtue of industry and the sin of idleness was no respecter of sexes. It applied equally to girls and boys. While in many cases no definite trade or art was specified in the indentures of girls, it is probably true that all were trained, according to their ability, to do the ordinary work of a housewife, including knitting and sewing; a large proportion of them were taught to spin, and many of them to weave cloth; but this teaching was in the home, not in the school.

What was true of apprenticeship and education in the New England colonies was, to a large extent, true in New York under English rule, but the laws there came later and their essential features were borrowed from New England laws.

Seybolt closes the last chapter in his book with these two paragraphs:

It is interesting to note that the legislative provisions for the kind of education to be given to apprentices in both the New England and New York colonies, is contained in Poor Laws. The indentures and other records indicate that they applied to voluntary industrial-apprentices as well as to poor-apprentices. There was no separate legislation concerning the education of the former class.

In New England and New York the first laws concerning education, and the first compulsory education laws were contained in apprenticeship enactments. As we have seen, the apprenticeship system took care of the entire problem of public elementary education during the colonial period. By the enactment of these laws the scope of apprenticeship was broadened to such an extent that it became a new, and peculiarly American institution. (1—107)

67. The Factory System and Its Effect upon Apprenticeship. Long before the Industrial Revolution certain defects in the apprenticeship system of education "in labor and learning" had become apparent. The tradesmen in the medieval towns "were both artisans and merchants, each conducting his own manufactory and offering his goods for sale." (5—43) As soon as the master became merely an employer and turned over the management of his apprentices to journeymen, and especially when he kept from five to ten apprentices to every journeyman, the old family relationship between master and apprentice, which had been similar to that of father to son, necessarily was lost, and with it a vital factor of the early system. The small shop then became more like a factory in its organization, and the tendency was to employ each workman chiefly on the thing that he could do most skilfully. (2—64) In many cases apprenticeship was so long that the apprentice lost interest in his work because he was paid no more to work than to remain idle. In 1776 Adam Smith (1723–1790) pointed to this defect and recommended that apprentices be treated like journeymen and paid "in proportion to the little work" they could do. If they spoiled materials "through awkwardness and inexperience," he would have them pay for these materials. The education of the apprentice, Smith thought, "would in this way be more effectual and always less tedious and expensive." (6—I, 162)

In the days when the old apprenticeship system was most effective it was under the strict regulation of the gilds which

were composed of master craftsmen, no journeyman or apprentice being admitted. In this respect they differed from the modern trade unions. When these gilds were gradually broken down by the development of the factory system, as they were in England, the regulating body of the apprenticeship system passed out also, for the British government was not prepared immediately to take their place in the way the Colonial governments had always done in America. (5—44)

The decline of the old apprenticeship system was most marked during the last quarter of the eighteenth and the early part of the nineteenth century when labor-saving machinery developed rapidly, especially in the textile industries. But before the machinery era began there was a transition period when weaving began to be taken from the homes and housed in "manufactories." In New England, for example, a "manufactory" was merely a room or rooms "where several looms were gathered and where a place of business could be maintained." These looms, however, were not of the modern type and required no motive power other than that of the hands and feet of the weavers. (4—37) The spinning of the yarn was still done by women in their homes and was delivered by them to the "manufactories."

The first important improvement in the looms was the fly-shuttle invented in 1738 by John Kay (1704–1764) of Colchester, England. In 1745 he patented, also, a power loom for narrow goods. In 1769 Richard Arkwright (1732–1792) patented the cotton-spinning frame and later became the first manufacturer to employ machinery on a large scale as a substitute for hand labor in textile mills. In 1769 James Watt (1736–1819) obtained a patent on his condensing steam-engine. And in 1770 the spinning-jenny was patented by James Hargreaves (———1778). In 1779 Samuel Crompton (1753–1827) invented the spinning mule, combining the inventions of Arkwright and Hargreaves.

The fly-shuttle was used in Providence, Rhode Island, as early as 1788 (4—45) In 1789 spinning machinery was installed in Samuel Slater's first cotton mill established in Rhode Island. (4—36) But "weaving did not become a factory occupation

in America until after 1814 when the first power loom was used here."(4—45)

These inventions and the demand for goods brought about remarkable changes. They took what had been a woman's home industry into factories. They created a demand for a great number of cheap laborers. They brought into the factories men, women and children who worked long hours at low wages. Even children as young as eight years old worked twelve or thirteen hours a day in both England and New England. Factory villages sprang up, first along streams where there was water power; later steam power often took the place of water power, and other considerations than power—usually quantity and cheapness of labor and shipping facilities—determined the location of factories.

Thus it was that in one important industry the old system of apprenticeship gave way to that of factory operatives. The British Parliament abolished compulsory apprenticeship in 1814, "but already the system had collapsed." (3—74) Even where the children in these factories were still called apprentices they were, for the most part, mere "hands" working under a system of child labor exploitation instead of a system of apprenticeship. The cruelty and social wastefulness of this system both in England and America was gradually recognized and conditions slowly improved, but even today, after more than a century of effort, in some places, children are being sacrificed to the god of Greed. What was true in this industry came gradually to be true in many others. Apprentices were superseded by machine operators, though there has always been a demand for workers who know the whole of their craft.

With the changes in industry wrought by the coming of the factory system, it was inevitable that corresponding changes must come in the system of schooling, and so there developed Sunday schools, part-time schools, factory schools, and continuation schools for factory workers.

68. **English Half-time Schools.** In a previous section (cf. 52) reference was made to the Factory Act of 1802. This Act was championed by the first Sir Robert Peel, who was himself a manufacturer. It was passed in the interest of

apprentices and was good as far as it went. It required that they should be properly clothed, fed and given instruction. Their work was limited to twelve hours a day, exclusive of meal time; night work was abolished and official visitors were to inspect the factories. (7—78) The Act was not very effective because as fast as steam power replaced water power, the mills moved into the large centers of population where they could secure child labor without an apprenticeship agreement and consequently without being required to clothe, feed, and teach the children. As these conditions were about as bad as the old, Sir Robert Peel again came to the relief of the children, and after four years of effort succeeded in obtaining, in 1819, an Act providing that "no child under nine years of age should be allowed to work in a cotton factory, and no young person under sixteen to work more than twelve hours a day, exclusive of meals." In 1825 the age limit in cotton factories was increased from sixteen to eighteen, the number of hours reduced from seventy-two a week to sixty-nine, and night work was prohibited in certain departments. This was beneficial but it did not help conditions in woolen, silk or other factories nor did it provide schooling for the children. (7—78) No provision was made for education until the Act of 1833. Meanwhile conditions were getting worse. The horrors of the factory system of that time are inconceivable today. The details are too inhuman to put in print. Knowledge of them aroused public-spirited men all over England, and in 1830 a comprehensive movement began which finally selected as its champion Lord Ashley (Anthony Ashley Cooper (1801–1885) became seventh Earl of Shaftsbury in 1851) who made the famous fight for the ten-hour law. Robert Southey (1775–1843), the poet, in a letter to Lord Ashley, said of the conditions in the factories, "I do not believe that anything more inhuman than the system has ever disgraced human nature in any age or country. Was I not right in saying that Moloch is a more merciful fiend than Mammon?" (7—85) At a later date Charles Dickens (1812–1870) visited the cotton mills of Manchester, and then wrote, "So far as seeing goes, I have seen enough for my purpose, and what I have seen has disgusted and astonished me beyond all

measure. I mean to strike the heaviest blow in my power for these unfortunate creatures, but whether I shall do so in the 'Nickleby,' or wait some other opportunity, I have not yet determined." (7—120)

Although Lord Ashley failed to get his ten-hour law, the effort forced the Government to pass the Factory Act of 1833 "which in respect to education was immensely in advance of all provision for the working class at the time," (9—47) and it "established, for the first time, the great principle that labor and education should be combined." (7—89)

"Under this statute children between nine and thirteen might only be employed if they had a voucher of having attended school two hours on six days in each preceding week. The Inspector might require the employer to make a deduction of one penny in the shilling from a child's wages, and pay the same for the schooling of the child according to his direction." (9—47)

To the friends of the children this law was not satisfactory either in its requirements or in the way they were enforced. Amending acts were presented and after another prolonged debate a new Act was passed in 1844. Under this act "children might be employed for half-time at eight instead of nine years of age, but the hours of labor were reduced. The parent or person having direct benefit from the wages of any child employed on alternate days had to cause the child to attend school for at least five hours between eight in the morning and six in the evening on the week-day preceding each day of employment. Children employed otherwise than on alternate days were to attend school for three hours on each working day of the week during any part of which they were employed, or two and a half hours on winter afternoons." (9—48) (Source Material VIII, A)

Thus there came into operation the half-time schools in English textile factories. Later acts extended the law to non-textile factories, raised the age limit from eight to ten (1874), then from ten to eleven (1893) and from eleven to twelve (1901).

The half-time school has caused much discussion among Englishmen. The half-time system at its best has brought

good results (Source Material VIII B); at its worst it has been no more than an apology for schooling. By 1911 it was quite generally agreed that the half-time schools should be abolished and in 1918 the Education Act did away with them, though at this writing, 1926, the appointed day for this section of the Act to go into effect has not been named.

69. **Seeking a Substitute for Apprenticeship in France.** For several centuries entrance to the handicrafts in France, as well as in England and other European countries had been regulated by the gilds. In the eighteenth century the French gilds became "trade aristocracies in which a few well-to-do masters held a monopoly of trade privileges." Admission to apprenticeship became very expensive. In addition to the money paid to the master the apprentice must also pay a fee to the gild. This caused the gilds to become increasingly unpopular. (8—I, 155) Under Louis XVI an effort was made to reform some of these abuses and when the Revolution came, popular opinion took action quickly. In 1791 the Constituent Assembly definitely abolished the gilds. Under this Act every person was given the liberty to apply himself to whatever art or craft he desired provided he could obtain a license and would conform to certain regulations. The authority to control and regulate apprenticeship was therefore suddenly transferred from the gilds to the government which under the circumstances could not at once provide a perfectly working substitute. The effect of this was damaging to apprenticeship itself and to the standard of workmanship generally. (10—703)

In 1803 a law was passed creating a consulting Chamber of Arts and Manufactures which contained some articles "designed to guarantee the execution of the apprentice contract on the part of the masters." Soon after this the advent of machinery and of factory methods of specialization all but completed the destruction of apprenticeship as a system of education for industry.

An inquiry of the Paris Chamber of Commerce showed that the control of apprenticeship had neither the importance nor the good consequences that it should have—that only a few contracts were written and that the conditions were not precise and permitted frequent changes. The law of 1851

attempted to regulate this situation and to lay down legal restrictions as to the contract and to otherwise protect the apprentice by defining the responsibilities of masters as to instruction. The law, however, failed to provide any supervision of the master, and made no provision to guarantee his capacity. As a consequence of this, certain benevolent societies came into being which endeavored to perform this task and place the boys with competent masters. (8—I, 155)

Laboring under these difficulties, it is not surprising that France should have early sought to find in trade and technical schooling a substitute for apprenticeship. Moreover, France had faith in technical education because long before the other nations she had engineering schools of high rank.

In France more than in any other country the effort has been made to develop not only technical and art schools supplementary to apprenticeship but schools actually to perform the function and take the place of apprenticeship. From the first the policy of the French people has been to effect these results mainly through public schools controlled by the central government. (8—I, 155)

70. **The Beginnings of the National Schools of Arts and Trades in France.** The origin of the national schools of arts and trades (Écoles Nationales d'Arts et Métiers) in France goes back to the end of the eighteenth century. It was in 1788 that the duke of La Rochefoucault-Liancourt established on his farm at La Montagne a school in which the sons of non-commissioned officers in his regiment might receive a general education and learn certain trades. In 1799 the Government of the First Republic was so favorably impressed with its advantages that it was declared a national school and transferred to Compiègne. A few years later Bonaparte, in the course of a visit through the northern cities of France, visited the school. He, also, was pleased and said, "I have found everywhere workmen distinguished in their craft, having great dexterity in execution, but hardly one who can make a drawing of the simplest type of a machine or could express his ideas by a sketch or by a memorandum. It is a gap in French industry; I will fill it up. No more Latin (that will be taught in the lycées which are going to be organized), but trades with the theory necessary for their progress. Here excellent foremen for our manufactories will be trained." In 1803 he reorganized the

school at Compiègne and three years later, because of the increasing number of students, he transferred the school to Châlons-sur-Marne, in the buildings of a former convent. (11—I, 271)

At the very beginning at Compiègne, boys were admitted at eight years of age. Up to twelve years, they were taught reading, writing, the elements of French grammar, arithmetic (the four rules and fractions), the elements of geometry and of drawing. Later came the study of descriptive geometry applied to the crafts, drawing and tinting applied to drawings of machines, and for the most gifted pupils, the application of the principles of mechanics.

There were five shops, as follows:

1. For the trades of blacksmith, fitter, machinist, and metal turner.
2. For the trade of foundryman.
3. For the trades of carpenter, joiner, and cabinet maker.
4. For the trade of wood-turner.
5. For the trade of wheelwright. (11—I, 273)

After 1826 the candidates for admission were required to be from thirteen to fifteen years of age, and they underwent a preliminary examination to show that they could read and write correctly and that they knew the four first rules in arithmetic. Two-thirds of each day was devoted to manual work and linear drawing, and the remainder to theoretical instruction. The length of the course was now made four years. In 1832 the age limit was again increased from fifteen to seventeen years and the admission was by competitive examination. (11—I, 275)

Meanwhile, another similar school was established. In 1804 a new school was opened at Beaupréau which was moved to Angers in 1815. In 1843 a third school was opened at Aix and at a later period still others. (11—I, 272) As originally planned these schools were intended to produce superior workmen who knew enough of related mathematics, science and drawing to enable them, at an early date after graduation, to take positions as foremen, superintendents, and draftsmen. After the competitive system of admission was well established, the

character of the students was such as to enable the schools to do a higher type of work and gradually the schools raised their standards until at a much later period they were doing work of collegiate grade and furnishing technical experts and engineers for a variety of industries.

71. **Findings and Recommendations of the French Commission of 1865 Concerning Child Labor in Factories.** In the year 1863 France appointed a national commission on technical education. The report of this commission, made in 1865, was considered so valuable in England that the Queen ordered it translated and a copy presented to each member of both houses of Parliament. While making their inquiries the members of the French Commission found that the law of 1841 regulating the labor of children in the factories was so inadequate and so poorly enforced that they decided to make a special study of it and of the kind of law that was needed. The question arose as to whether the numerous children working in small shops were and should be under the same regulations as those in the large factories. (12—27) The following is from the report of the Commission:

The discussion began as to the age at which the admission of children into workshops and manufactories should be permitted. The lower limit of eight years fixed by Article 2 of the law did not appear high enough. At that age, which is one of growth, the child is not sufficiently developed, and has not acquired the needful strength to resist the fatigue induced by work, though to all appearances the work may be light; besides he has need of liberty and the open air, and it is already a great restraint to keep him for some hours in school that he may acquire primary instruction, which scarcely begins at the age of seven or eight. If to this be added the labour of the workshop, there will be some danger of injuring his physical development and consequently that of the whole population. The application of the Recruitment Law proves that in a somewhat large number of Departments, and principally in manufacturing towns, it is difficult and sometimes impossible to obtain the contingent of young men of 20 years of age required for the army. In spite of the prescriptions of Article 5 relating to attendance at school, which attendance is almost a fiction through the non-observance of the law, the boys admitted into manufactories, and especially those employed in small workshops, are too often deprived of all instruction, so that their mental development is as much neglected as their physical constitution is deteriorated.

These considerations led the Commission to declare, without a dissentient voice, that the limit of eight years is too low. It was proposed by several members to raise it to 12, as determined in Prussia by the Royal Ordinance of the 16th of May, 1853. At that age, in fact, primary schooling may be

about finished, religious instruction has been imparted, the child has developed, and is, in general, strong enough to yield a certain quota of work without injury.

On the other hand, however, it was objected, that in many trades it is almost indispensable to employ children rather younger; that the parents too have need of the child's little earnings; and that if the limit of the working day is fixed lower than that authorized by the law of 1841, the requirements of instruction and those of physical development could be satisfied by fixing at 10 the age of admission into workshops and manufactories.

These various reasons, and the desire of not introducing too abrupt a change into the existing state of things, led the Commission to adopt the following resolution:

It is desirable that the limit of age for the admission of children into workshops and manufactories should be raised only to ten years.

The next question which presented itself to the Commission, and which, from the same points of view, is not less important than the preceding, was that of the length of the working day for children of from 10 to 13 years old. For several years this question has been raised at the repeated instigation of the Industrial Society of Mulhouse, which on various occasions has asked that the working-day for children in manufactories should be reduced to six hours; and that the number of those employed should be doubled, in order that the same amount of work might still be done. The other half of the day might thus be devoted partly to school and partly to rest and physical exercise, which is so necessary to childhood. An engineer of standing, who gave evidence before the Commission, likewise announced that in a large establishment for the construction of machinery, the company to which he belongs purposed doubling the number of apprentices employed, so as to be able to reduce their work to six hours. This is the limit fixed in Prussia by the Royal Ordinance before mentioned. The same regulation is adopted in some of the manufactories in the north of England, where work is successfully combined with attendance at school.

The possibility of thus rendering the labour of children in manufactories compatible with the instruction they need is proved in that part of England by the establishment of half-time schools, in which children of from 8 to 13 years of age must not, according to law, be occupied more than six hours a day. In England, as well as in Belgium, it has been remarked that children who for half the day are subject to the discipline of the workshop, pay great attention to their lessons at school, and acquire the instruction there given about as rapidly as those who go to school the whole day.

The whole of the foregoing considerations determined the Commission to recommend:

That the labour of children of from 10 to 13 years of age, both in workshops and manufactories, should for the future be limited to six hours per day, and that a portion of the other half of the day should be given to attendance at school.

It will be remarked that such a regulation might very easily, with the help of the employer, be combined with a rule which should oblige the children to attend the school connected with the establishment, as indeed is already done in a large number of manufactories, in which the working population thus

obtain the instruction they need, and the employer can rely on an intelligent set of workmen. The Commission is of opinion:

That for lads of from 13 to 16 years of age, the working day ought to be limited to 10 hours in all workshops as well as in manufactories. This would leave to those employed either as workmen or as apprentices at least two hours every evening, which they could devote to their instruction by attendance at lessons and classes.

That even in manufactories it is desirable that the obligation of attending a school, imposed by Article 5 of the law, should be extended to lads of from 13 to 16 years of age, so that by means of lectures and classes they might be able to complete their primary schooling and acquire a certain degree of technical instruction, as is done with success at Graffenstadt, La Ciotat, Wesserling, Creuzot, and in many other establishments. (12—28–30)

72. **Value of Special Instruction Shops in Apprentice Training.** The French Commission of 1865 came to realize that instruction shops were being connected with schools for various purposes and for students of a wide range of capacity. In classifying these purposes the Commission pointed out: (a) That in some schools, like the Belgian weaving schools and the agricultural and other institutions for orphans, which combined elementary general education with apprenticeship, the purpose and effort is limited to the training of "apprentices of the humblest order." (b) Others, like the workshops of the Christian Brothers, take the boy when he leaves the elementary school and "improve his instruction at the same time that they teach him a trade." (c) Still others aim merely to teach the principles, theory, and practice of industries in order to produce good foremen and factory superintendents. In the first of these, then, the purpose was to train factory operatives, in the second skilled craftsmen, and in the third technical experts and executives. The Commission concluded that all of these purposes were commendable and that they deserved the "sympathy and encouragement of the State." But each workshop should be suited to the demands of the local industry. The Commission did not look forward to any large proportion of the necessary workmen being trained in this way, for they considered that the great mass of apprentices would always have to be trained in the factories. (12—22) It did, however, urge that an effort be made to give the young workman the technical instruction he needed. It recommended

that instead of the "purely oral lecture," regular classes be established on Sundays and the evenings of working days, and that the instruction "explain in the simplest possible manner the principles of science by the aid of facts, and by showing their application," and should include "drawing with all its applications to the different industrial arts." (12—47)

The Commission recognized that the opinions of persons who had given much attention to training apprentices were divided as to whether special instruction shops were desirable. It was aware of the seriousness of the criticism that the instruction shop did not accustom its pupils to work with that rapidity of execution which is fundamental in economical production. It was, however, inclined to believe that this defect could be remedied with "a good organization, meeting as far as possible the normal requirements of industry." (12—20) Furthermore, the Commission took the stand that the chief object of instruction shops is not and ought not to be production of machine operatives; therefore the principle of division of labor is not introduced into them. "On the contrary, care is taken to get the pupils to execute in succession various objects graduated according to their progress, so as to teach them every branch of the trade they intend to follow. A real apprenticeship is thus given to them more effectually." (12—21)

In support of its contention, the Commission gives a list of schools having apprentice workshops, many of which are directed by the Christian Brothers, and then adds:

> In all these establishments experience proves that, on leaving, the pupils have acquired sufficient ability in the trade they are intended for to enable them to obtain wages at least as high as those earned by ordinary apprentices, and that they have received or improved their general and technical instruction up to the limits required by their social position. With this instruction one generally combined habits of order and morality, which cause them to be sought for by the heads of workshops. (12—21)

In contrast with this statement the editors of the *Journal of Technical Education* say, when examined by the Commission:

> For them (the artizans) there is nothing but apprenticeship, an institution condemned by moralists, political economists, and by manufacturers them-

selves. By the law of the 22nd February, 1851, the master is only bound to teach his apprentice the practice of his trade; the latter has few opportunities of acquiring a knowledge of the applied sciences, which alone are the very foundation of industrial manufactures. It is true if the apprentice be less than 16 years old, and can neither read nor write, or has not completed his religious instruction, he can claim two hours a day to devote to school work; but the carelessness of parents, the idleness of the children, and the negligence of the masters have combined to render this part of the law a dead letter. Even the practice of their trades the apprentices do not properly acquire. In small industries the subdivision of labor causes them to learn only one branch, in large works they are placed under the care of a foreman or journeyman, who has no interest in teaching them properly. (12—60)

73. **Value of the School Workshop in Technical Training.** One of the features of the French technical schools that caused much discussion in France and later in England and America was the introduction of workshops as a vital part of the scheme of training. One of the experts examined by the Commission of 1865 accounted for the shops in this way:

A knowledge of manipulation is required in the chemical art; why should it be otherwise in a knowledge of the construction of machines and buildings? It is only possible to teach by four methods: 1st, oral explanation given by the teacher; 2nd, written explanation taken from books; 3rd, graphic explanation rendered by drawing; and 4th, practical explanation obtained from execution. Up to the present time only the first three methods of demonstration have been employed, and nothing but theorists produced. . . . Every technical school must admit into its course the manual labor of the workshop and of the laboratory; that is its distinctive characteristic, the cause of its existence. (12—59, 60)

Another expert, Mr. Bader, director of the technical school at Mulhouse, in his testimony assumes that practical knowledge of the workshop processes and materials is an essential factor in training technical experts, superintendents, and other executives, and looks upon the school workshop as the only means of acquiring this knowledge since the young men taking technical training cannot become apprentices in the workshops of factories. (12—95) (Source Material VIII c)

Mr. Gerardon, director of the Central School at Lyons, said that the purpose of the shopwork in the technical school is not "to give an elementary knowledge of tools to one who is to become a skilled artizan; it is rather that those whose future career will place them in a position to direct and superintend

workmen, may be able to show them how to set about their work, may know the use of tools, and the technical terms. Another object of this course of manual labor is to enable the pupil to apply what he has learned in his theoretical studies." (12—102)

In discussing the National Schools of Arts and Trades the French Commission of 1865 says that so far as shopwork in these schools is concerned, the young men should be taught "the principal rules of each art." . . . "With the help of these principles" the graduates of these schools can "quickly become skilled artisans, working with all desirable rapidity," but it states with emphasis that making skilled artisans is not the object of these schools. It is, rather, to produce foremen, superintendents, and technicians. In these schools, however, at the time the report was written, seven hours a day were given to shopwork and five hours to theoretical instruction including drawing. Technical drawing was considered "the indispensable basis for all good construction" and was carried further in these than in any other schools either in France or in any other country. The shopwork consisted of joinery, pattern making, foundry work, blacksmithing, and machine construction.

74. **General Educational Value of Shopwork Recognized in France.** In view of what took place in America a dozen years later it is interesting to examine some of the testimony before the French Commission of 1865 in reference to their estimate of the general educational value of shopwork: All the pupils of La Martinière School at Lyons, "divided into several sections, pass an hour a day in the workshops, where they are instructed in carpentry, the use of the file and of the lathe. They are practiced in each of these kinds of labor alternately, and spend a month at each in succession. Here they learn the proper use of tools; skilful and intelligent masters show and explain to them as soon as they enter that which they could learn in the manufactory only by imitating and a long course of observation. Here again the son of a carpenter, if he shows more aptitude for the file than the plane can make up his mind to enter the trade of a locksmith, mechanic or fitter. And besides,

anyone having passed through this succession of labors, has acquired a fund of skill useful to him in any handicraft." (12—98)

The director of the school at Mulhouse, after mentioning the machine shop and the weaving school says: "There is also a carpenter's shop, in which a sort of preparatory training is given to the pupils of twelve and thirteen years old, the object of which is not to turn out carpenters and joiners, but to give the pupils a taste for manual labor, and to form the hand and the eye; it may almost be considered in the light of an athletic exercise. The students attend in this shop only one hour three times a week, and are practiced in planing, in making small articles of cabinet work, and at the lathe." (12—89) (Source Material VIII c)

75. **Drawing in French Schools for Industrial Training.** On account of the fact that France led the world in engineering education, (cf. 84) she also led the other nations in the development of instruction in technical drawing for the industries. Before 1865 technical drawing in the French trade and industrial schools, both in subject-matter and method had reached a high standard.

Some of the characteristics of this instruction in drawing are the following:

(1) Early emphasis on geometrical drawing, followed by

(2) Projection drawing leading up to dimensioned sketches, at the same time giving special attention to training the memory for form and developing the constructive imagination.

(3) Drawing to scale.

(4) Machine drawing taught through the making of sections and details from assembly drawings and assembly drawings from detail drawings.

(5) Designing parts of machines, applying knowledge of strength of materials.

(6) Visiting factories to make dimensioned sketches of machines from which finished drawings were to be made.

In the report of the French Commission on Technical Instruction is the following description of the drawing instruction at Lyons:

> At the Central School as at La Martinière, the pupil from his first entrance begins to draw in perspective from models; then he passes quickly to projection, which is more closely connected with the labour of the workshop. As soon as he has acquired sufficient skill, the following plan is pursued: a model is placed before 12 or 14 pupils; the teacher takes it to pieces before them, explains the principal arrangements, draws attention to the different forms, and after having given all necessary explanations removes the model. The pupil must then execute from memory and without instruments, sketches of the whole, and of the details and sections required by the teacher. When the time fixed for the execution of this drawing from memory has elapsed, the model is replaced before the pupils, the teacher points out the corrections to be made, and a pupil placed close to the model takes all the measurements and dictates the dimensions. The model is once more removed, and from the sketch the pupil must now make a drawing to scale. This kind of work, and a little drawing of ornament and practice in tinting, constitute the study of the first year. During the second and third years, the pupils while continuing from time to time the drawing from memory, pass on to another kind of study. Drawings of machines are given to them, but not to be servilely copied; they are required to draw a section on a line marked on the drawing. In this way the pupil can never copy a drawing without understanding it; he must analyze it in all its particulars for himself. To others, again, is given a drawing, as for example, of a steam-engine, taken from some work on machinery, together with the text which accompanies it. The teacher explains to the pupil a certain portion of the machine—the cylinder for instance, with the arrangement of its parts; the latter must then draw every piece of it (as if it were taken completely to pieces) to a certain fixed scale. When this work is finished the copy is removed, and the pupil must proceed to draw the whole from the drawings which he has already made of the parts. In these two divisions the young men are also practised in making designs of parts of machines according to the principles of the strength of materials which they have learned in school; designs for boilers according to the principles of physics; designs of machines or of buildings of all kinds as applications of the sciences which they have studied at school. As a supplement to the study of drawing, the pupils of the second and third years visit every Thursday certain manufactories which are fixed upon, and must bring back figured sketches of some of the machines; these they must afterwards reproduce as finished drawings to scale. Afterwards from all these drawings a selection is made of those which possess most interest, or are of the greatest utility, and these being lithographed, an album is made intended specially for the use of the pupils of the school. (12—102) (13—192)

At the beginning of the course the first models from which the pupil makes perspective drawings are "figures in iron wire, representing cubes, prisms, pyramids, etc.; then he draws

parts of machines and finally complete machines." (13—191) After this work in perspective comes the projection drawing, making dimensioned sketches and drawing to scale. Finally pupils were taught how to tint drawings. (13—192)

Not all the schools teaching projection drawing employed the methods used at Lyons, described above. A common method was for the teacher or some pupil to make a working sketch of some object on the blackboard while the other pupils copied it in their note-books. (12—24) In other cases the drawings for the pupils to copy were on charts or large sheets 3 ft. by 4 ft. instead of on the blackboard. In order to make sure that the pupils could visualize the forms represented in the drawings, models of the objects themselves were made of wood or plaster or cast in metal and placed before the pupils so that they might be compared with the large drawings. The models were often cut with vertical or horizontal planes so that their details might be better understood. By this means it was found possible "to make children of from ten to thirteen years understand the theory of projections." (13—188)

Another feature of the industrial drawing was copying drawings of ornament. In 1860 a series of copy-books was published which was intended "to popularize the drawing of ornament in all schools, from the village school to the middle-class school of large towns." Pupils were taught not only to draw, but also to distinguish between Grecian, Roman, Byzantine, Gothic, and Renaissance ornament. Original design was attempted. The drawing of ornament from the flat was followed by drawing from cast and sometimes, also by modeling (13—188)

The emphasis given to drawing in the report of the French Commission of 1865 is explained by the two following paragraphs taken from the report:

> Among all the branches of instruction, which in different degrees, from the highest to the lowest grade, can contribute to the technical education of either sex, drawing, in all its forms and applications, has been almost unanimously regarded as the one which it is most important to make common. (13—208)
>
> The Commission attaches great importance to extending the teaching of geometrical drawing, as well in primary schools as in establishments devoted to technical instruction. It regards geometrical drawing as a most useful

training for the practice of various trades and as an excellent means of direct demonstration. (12—81)

76. **Child Labor Regulations in Germany.** Reference has already been made to the fact that in 1853 the Prussian Government had decreed that children under twelve years of age could not work in factories. (cf. 71) The same law stated that no child under sixteen years of age could work in a factory until his father or guardian presented a certificate stating that the child could read and write, and that the manufacturer must keep such certificate and produce it when required to do so by the authorities. Children under fourteen were not allowed to work more than six hours a day, and three hours a day were to be devoted to instruction. Moreover, it was strictly forbidden to allow children under sixteen years of age to work before half-past five in the morning or after eight in the evening.

"Graduated penalties, increasing for each repetition of the offence" were applied in punishment for the breaking of "these rules for the protection of childhood." Government inspectors were appointed to see that the regulations were enforced. These inspectors were entrusted, also, with the enforcement of regulations concerning the working conditions of the children. The Austrian and Saxon governments had similiar regulations concerning child labor. (12—9)

77. **Continuation Schools of Germany.** It follows quite logically that a nation that leads all others in passing compulsory elementary school attendance laws (cf. 62) and in the regulation of child labor should also develop a system of compulsory continuation schools. This was true of Germany. The continuation schools grew out of the Sunday schools which had existed for several centuries. "Originally their main purpose was to strengthen and deepen the religious knowledge of the children; and the instruction in the Church Catechism, which was given after the pupils had left the elementary school, was regarded as the first step towards this end. The first German states to make attendance at these schools compulsory on young people of both sexes were Würtemberg (in 1739) and Bavaria (in 1803). In Bavaria, a young man could

not marry unless he first produced a certificate that he had gone through the course at a Sunday school." (14—520) Instruction was given in reading and writing as well as religion. Sometimes these schools were a substitute for the regular elementary school for children "who were prevented by domestic duties from attending school on week-days. The regulations for compulsory attendance, however, were never strictly enforced; indeed their enforcement was out of the question owing to the lack of teachers and school accommodation." (14—520) The results, therefore, were not satisfactory for the education of apprentices and other industrial workers.

With the changes in social conditions wrought by the coming of the factory system and the acute industrial competition with England and France, in which the Germans were being beaten, the employers began to realize that intelligent industrial workmen were essential to success under the new industrial system, and workmen began to place a new value on schooling. One of the results of these changes was a very largely increased demand for art instruction, especially after the German humiliation at the International Exposition in London in 1851. The verdict of Reuleaux, "cheap and poor," was taken to heart and the prevailing effort in German schools of industrial art was to give training in artistic taste. Another result was the development of continuation schools.

Even before the London exposition, there was a "vigorous movement on the part of town councils and trade associations for the establishment of continuation schools." For example, as early as 1835 "the local authorities in Saxony were given statutory power to enforce attendance at such schools. But in the fifties the current of feeling changed. Elementary education was now universal. There were many who held that the work of the continuation schools had therefore become unnecessary." In 1859 the power to enforce attendance was withdrawn in Saxony, as it had been elsewhere, and the continuation schools declined in efficiency. (14—521) "But the tide soon turned. Complaints of the defective training of the younger workers in industry, in commerce and in agriculture took the ear of the public." It was felt that the masses of the

population must be educated for their duties as citizens and that this education must extend beyond the fourteenth year. (14—522)

The decisive step was taken in 1869 when "under the terms of the 'Regulation of Industry' employers were compelled to allow their workmen under eighteen years of age to attend a recognised continuation school, and the communes were empowered to frame by-laws making attendance at such schools obligatory on all workmen under eighteen." (14—522) This was the beginning of the remarkable development of such schools that came in the years that followed and attracted the attention of educators throughout the world.

78. **Shopwork Instruction in German Schools.** The Industrial Revolution did not have the same effect upon the apprenticeship system in Germany as it did upon England and France. There was no rapid breaking down of the old system as the result of the introduction of factories. On the contrary, the gilds of craftsmen retained much of their power and the people believed in the apprenticeship system that had served them so well. Two results followed: One was the bitterly fought competition between the handicraftsman with his small-scale production, on the one hand, and the manufacturer with his large-scale production on the other. This resulted in "two distinct industrial systems" and "the enactment of labor codes for each." (15—22) The other result was less demand for shopwork training in the schools for apprentices and industrial workers. The complete trade school was slow in coming in Germany, while the continuation schools and other schools to supplement apprenticeship flourished.

Bache, however, in the report of his visits in 1836 to 1838 gives an account of a school in which shopwork, to take the place of apprenticeship, was given prominence. This was the Institute of Trades (Gewerbeinstitut) in Berlin, supported in part by Baron von Seydlitz and in part by the government. In this school the general scheme was to give instruction in the theoretical studies in a winter term and to devote the summer term to practical instruction. One division in this school spent four days a week from seven o'clock in the morning to

noon and from one o'clock in the afternoon to seven in the workshops, and two days in machine drawing and the study of machinery. (16—580, 581) Concerning this shopwork Bache says:

In the shops for the instruction of mechanics are machines for working in wood and the metals, a steam-engine of four horses' power, a forge, tools in great variety, lathes, etc. The pupils have the use of all necessary implements, according to their progress, and are gradually taught, as if serving a regular apprenticeship. When capable, they are enabled to construct machines which may be useful to them subsequently, as a lathe, or machine for cutting screws, or the teeth of wheels, etc., and are furnished with all the materials for the purpose, the machine becoming their own property. In these shops, also, the models for the cabinet of the school are made. This is by far the most complete establishment for practice which I met with in any institution, and I believe the practice is both real and effectual. It involves, however, an expenditure which in other cases it has not been practicable to command. The scale of the whole institution is, in the particular of expenditure, most generous. (16—577, 578)

He then proceeds to compare the shopwork in this school with that in others he has seen:

This is one specimen of the various plans which have been devised to give practical knowledge of an art in connection with theory in a school. It is first most judiciously laid down that certain trades cannot be taught to advantage in a similar connection, but that the practical knowledge must be acquired by an apprenticeship antecedent to the theoretical studies. There are besides, however, a large number of trades, the practice of which is to be taught in the institution, and requiring a very considerable expenditure to carry out the design properly. This could not be attempted in a school less munificently endowed, and requires very strict regulations to carry it through even here. The habits of a school work-shop are, in general, not those of a real manufactory, where the same articles are made to be sold as a source of profit; hence though the practical knowledge may be acquired, the habits of work are not, and the mechanic may be well taught but not well trained. At the private school of Charonne (in France), work-shops were established, giving a variety of occupations to the pupils; but the disposition to play rather than to work, rendered these establishments too costly to be supported by a private institution, and the plan adopted instead of this, was to make the pupils enter a regular work-shop for a stated number of hours, to work for the proprietor or lessee. This plan remedies one evil, but introduces another, that as the machinist takes orders, with a view to profit, the work may have so little variety as only to benefit a small class of pupils. The pupils at Charonne are, however, under different circumstances from those at Berlin; they are generally younger, and, being independent of the school, where they pay for their education, are not under the same restraint as in the other institution; hence the experience of the one school does not apply in full force to the other. At Dresden, in a school somewhat similar, to that of Berlin,

a different mode from either of those just mentioned has been adopted. An arrangement is made with a number of mechanics, of different occupations, to receive pupils from the schools as apprentices, allowing them the privilege of attending, during certain specified hours of the day, upon the theoretical exercises of the institution. Where such an arrangement can be made, the results are unexceptionable, and the advantages likely to accrue to the mechanic arts, from the union of theory with practice, will offer a strong inducement to liberally disposed mechanics to take apprentices upon these terms. Small work-shops, connected with an institution, must necessarily offer inferior advantages even if closely regulated, so as to produce the greatest possible amount of work from the pupils; this should not be done for the sake of the profit, but to give him genuinely good habits. (16—578, 579)

Several years later, in 1852, Sir Lyon Playfair (1819–1898) of London, stated that the Institute of Trades in Berlin had abandoned its plan of giving practical shopwork instruction. He said that, "as might have been anticipated" such instruction "was found to be of little advantage." He further states that shopwork instruction had been "abandoned by almost all the schools, only one or two being still found hovering on the outskirts of this error. In addition of the folly of attempting to teach the practice of an art within the confines of an institution chiefly devoted to other objects, it was found to be highly detrimental to the progress of the students, who were glad to escape from the mental labour of the classes to the muscular labor of the workshops." (17—32)

Lord Playfair was a partisan in a controversy that continued for many years. The right basis for settlement of it did not come until about twenty years later when it was found that the same principles of pedagogical analysis must be applied to teaching shopwork as had been applied in teaching other school subjects.

79. **Drawing Instruction in Germany.** England was not the only country to profit by the revelations of the World's Fair in London in 1851. Germany also recognized the superiority of French manufactures and immediately took steps to meet the competition by establishing museums and schools of art. In the Kingdom of Würtemberg, for example, "the Department of Commerce and Industry organized in nearly every town classes for drawing, modeling and sculpture in wood and stone." (12—80) At first these were free, but later experience

proved that a larger number would attend when a small fee was charged. (13—206) They were evening schools—from seven to nine o'clock, three evenings a week, and were taught by selected expert craftsmen of the town. The course of instruction began with copying a few lithographs. Then followed work from plaster casts graduated from simple figures to fine examples from the antique. These were supplemented by a study of the best publications on industrial art which were loaned for short periods, being sent from school to school throughout the country. (13—206)

The French Commission of 1865 said in its report that the drawing school at Nuremberg was the best in Central Germany. The director of this school had maintained that "to become a skilful industrial artist, it is indispensable first to study art in all its varieties. Under his energetic supervision a great number of professors and artists have been trained who have disseminated good methods, and have brought about in the productions of industry, especially in those of Nuremberg, a most remarkable artistic improvement." (12—80) The Commission's detailed report of the school in Nuremberg is as follows:

In this town, so noted for its various manufactures, there are several drawing schools of different degrees, according to the trade the pupils intend to follow. The first and most important is the higher school of industrial drawing conducted by M. Kröeling. It is justly regarded in Germany as the one which has rendered most services to industry. In order that the pupils may, in a few years, acquire some real skill, none are admitted but those who have already attained considerable proficiency. The principle adopted by the professor of this school is that, in order to form good industrial draughtsmen, the pupils must pass through all the degrees of artistic drawing, so that they may be able, in the very varied and different combinations required by manufacturers, to blend judiciously and harmoniously all the various kinds, without there being any necessity, as too often happens, for having recourse to one artist for the architectural part, to another for the figures, and to a third for the ornaments, etc.

As for the method of teaching, it is exclusively based on drawing from models in relief, graduated according to the proficiency of the learners, and advancing from the simplest models to the finest left by ancient art, and then to nature. The talented director expresses his antipathy to copying from lithographs, which he regards as caligraphy, not drawing. In accordance with these principles, he has formed for his pupils very fine and very complete collections of models. The teaching is distributed in three divisions:—1, draw-

ing for ornament; 2, drawing from the antique; 3, drawing from nature. After attaining proficiency in drawing, the pupils pass on to modelling and sculpture in wood and stone; then, as soon as they have attained a certain degree of skill, they have to compose designs, and to model and carve them.

The general opinion of the persons who have made a study of questions connected with teaching, not only in Bavaria, but also in other parts of Germany, is that the Nuremberg school has contributed more than any other to the progress of the national industry. This progress is especially manifest in the very decided improvement in the manufacture of children's toys, which are one of the staple productions of the country. For some years past, the improvement in the forms of the articles, whether moulded in clay or sculptured in wood, with which the Nuremberg manufacturers supply the shops of Paris, has shown us that great progress must have been made in the teaching of drawing, and ample confirmation of this opinion may be obtained on visiting the higher drawing school of this town. The Parisian manufacturers, though superior in other matters dependent on the arts of design, are, with regard to children's toys, very inferior to the Nuremberg artisans.

As a preparation for the higher drawing school, there is an elementary school with courses occupying two years. The first, of eight hours' lessons per week, is entirely devoted to free-hand drawing, beginning with exercises on straight lines and curves, on plane surfaces, on symmetrical and regular bodies, and on simplex and complex ornaments, finishing with compositions. The second course, of six hours per week, is devoted to drawing ornaments, to drawing from the round, from the antique, and also to drawing furniture. (12—143, 144)

SOURCE MATERIAL VIII, A

British Half-Time Schools as Reported by Government Inspectors of Schools in England

The greatest of these (evils which are common to the whole manufacturing districts) because the most general hindrance to the intellectual progress of schools—and, it must be feared, also, in some instances, to their moral growth —is the existence in them of a class of children, called from the hours of their employment "short timers." They are those employed in the mills under the age of 13, who, by the late Factory Regulation Bill, are only allowed to work short time, the other parts of the working hours of the day they are to spend at school. They come accordingly to school, alternately morning and afternoon, for three, or, in a few cases, by an equally wise and kind arrangement of the masters of mills, for four hours of a day. The appearance of these poor children, for they are both girls and boys, is painfully interesting. Where others are clean in person, and neat in dress, and happy in expression,—these are dirty and labour-soiled, in ragged and scanty clothes, with heavy eyes and worn faces. In the clothing districts, their faces, necks and hands are deeply stained with the blue of the dye used for the cloth. From the spinning mills they come covered with the "flock," or as it is termed, "the fluff" of the yarn—their hair thickly powdered with it—tangled, especially that of the girls, as if no comb could ever penetrate it; the black velveteen dress of the lads, and the thick brown dresses of the girls, bearing on them plentiful memorials of the scene which they have just left—the mill,

with its "fluff-laden" atmosphere, and its continual whirl of machinery. They seem to take their places in the school as if they did not belong to it, and had no business there. I thought that, in some cases which came under my observation, the masters did not strive much to make these poor children feel themselves at home. In one instance . . . they were all huddled together in a large class close to the door, in the coldest and most comfortless part of the room. I fancied, perhaps wrongly, that there was little notice taken of them in the business of the school. They were too closely packed to be at ease; and they either looked idly about them, or talked together, with their books at their mouths. I was struck with their appearance, and inquired the reason of their separation from the rest of the school. The plea was that of necessity. The master professed himself unable to include them in the various classes, without materially injuring the progress of the other children. There was some show of reason in this answer. Yet one thing seems plain—both charity and justice seem to demand it, that, whatever be the consequence, such an arrangement should not be allowed in our Church-schools. It surely can neither be expedient nor right, that these poor, hard-working children, should thus have a wall of separation built up between them and their more fortunate school-fellows—if it be not a mockery to use this word—that they should have a mark set upon them as if they had done something deserving of punishment. I fear that they have enough of suffering and sorrow, both at home and in their work, without adding any feelings of shame or bitterness in those which are, probably, the quietest hours of their lives, the hours spent at school, which are intended to raise them above the weariness and the privations of their daily existence. I have often sat amongst them, and questioned them as to their little stores of knowledge; and though frequently very ignorant, I have always found them respond to a kind word or friendly look, whilst they seem to be humble and docile, and in many cases exceedingly attentive to any effort made to instruct them. At the —— school, where the majority of children were of this class, I had much cause to be pleased, both with their intelligence and general conduct. The master there seemed to be interested in them, and pointed out to me one or two boys of great quickness and considerable acquirements. I remember, that he lamented the singularly wayward temper of one of them. If he did not answer the first question proposed, he would be silent during the remainder of a lesson. Now this is just the character of the uneducated animal man; easily elated, easily cast down—noisy, or sulky. It is plain that comparatively little can be done for them by the most willing and able master, in the few hours of their short school-life. Yet something more may be attempted; and something more may surely be done by better arrangements, and by a more earnest superintendence of this portion of a school; whilst it must not be forgotten, that, in their present state, they are a serious hinderance to the general progress of a mixed school. I mean a school where they are mixed with other children. (From report of 1845) (18—87–89)

The upper class makes a good abstract of a previous lesson. The short-time girls are bad at first; but, after they have been a little time in the school, more anxious to improve than others. (From report of 1847) (18—91)

In some instances the spectacle presented was of a less unsatisfactory description. For example, I find from my diaries, in a report upon an excellent

school consisting chiefly of factory children, the following remarks:—"With special attention to the point, I could discover but little difference between the whole-day and half-day scholars of the upper classes. All are fused together, and the whole-day scholars sacrificed to the greater number. The master says that the half-day scholars are very anxious not to be left behind. In the lower classes there was many a sad instance of backwardness and ignorance; e.g., boys of 11 and 12 years old scarcely able to read monosyllables." (From report of 1848) (18—91, 92)

Many of the millowners have already given an earnest of the spirit which will one day, I trust, inspire all of them; when they will duly recognize that their "hands" have hearts to feel, minds to think, and souls to be saved. The work of education here is very mainly dependent upon this good and conscientious feeling, which I believe is growing up among the master manufacturers. But in truth their interest also will, I am sure, in this matter be found in the long run to be on the side of their duty. They will find it cheaper to contribute largely to education than to have unintelligent, immoral, or ill-disposed workmen. If the people of that day had been well-educated, Arkwright and Hargreaves would never have had to fly from Lancashire for their lives—the one for contriving the water-frame, the other for inventing the spinning-jenny. But next . . . there are the impediments arising from the social state and habits of the *parents*. They work hard, but they also drink hard. They earn good wages, but they also spend them, and acquire no property. (From report of 1850) (18—92)

A movement is going on in——which seems to promise well. The members of 127 firms have announced their determination to give a preference in employment to such hands as can read and write. This will overcome, to a great extent, the indifference to education so prevalent among the parents, and which has been the greatest hinderance to education among the working classes; and perhaps it is going as far in encouraging education as is possible without making it compulsory. (From report of 1850) (18—92, 93)

SOURCE MATERIAL VIII, B

Advantages of the Half-Time Schools

From *The Half-time System and Agricultural Schools* by Edward Senior, Poor Law Commissioner, in Transactions of the National Association for the Promotion of Social Science, 1861.

By the half-time system, as applied to the education of the poor, is meant a system under which half the time of the pupils is devoted to literary instruction and the remaining half to industrial pursuits. The problem to be solved is, whether so short a period as three hours daily is sufficient to teach a child the usual amount of knowledge imparted in the schools of the poor. Considerable light has been thrown on the question by a Parliamentary paper of the last Session (No. 167) by Edwin Chadwick, Esq., whose labors are so well known to the body I have the honor of addressing. In that paper we find teachers of factory schools, of agricultural schools and pauper schools, all agreeing, that not only do the children acquire as much literary knowledge when literary and industrial education are combined, and the time given to

the former is limited, but that an actual improvement takes place. Mr. Tufnell, inspector under the Privy Council of pauper schools, gives most remarkable testimony in favor of the system. Miss Mary Carpenter, the highest authority on the education of the poor, says, "I propose that the factory half-time system should be extended to all schools where the children are employed at labour." . . . "I believe three hours per diem of good scholastic instruction would be amply sufficient for the children of the working classes; but this must be supplemented in the case of boys by two or three hours of manual occupation, involving skill, exactness, manual aptitude, and, in that of girls, by needlework and other domestic occupations. This education should be combined till at least twelve years of age; and, if possible, until fourteen, when boys are apprenticed." She adds, "I feel confident, from my experience and observation, that the real education of the working classes would be improved by devoting three hours daily instead of five or six to direct intellectual instruction, the faculties of the children being strengthened and trained in other ways by industrial occupation, which develops many powers comparatively untouched by book learning. The education thus becomes more real, and the knowledge more fixed in mind, and more likely to be permanently useful. Another advantage is, that the parents will have a distinct motive for regularity, and for sending the children to school, the earnings of the children being dependent on this."

The Poor Law Commission, of which I am a member, have expressed their views on this subject in a circular to their inspectors, dated 20th January, 1853, as follows: "It has been observed that where the school hours have been limited, and the children employed in the open air, they have assumed a stronger and healthier appearance, whilst they have not fallen back in other branches of knowledge. The Commissioners believe it to be of the utmost importance that children who have to live by their labour should be trained to labour early. A boy who has not handled a spade at the age of fourteen will rarely turn out an active labourer, and it is therefore most desirable that the boys generally should be accustomed to work at the earliest practicable age. It has been observed that the success of all benevolent institutions for the education of the children of the poor, at home and on the Continent, has in no small degree turned on the amount of industrial training provided for the children, and that those institutions have been less useful where the chief efforts have been directed to literary attainments. The guardians should, of course, provide the necessary agricultural implements suited to the age and strength of the children. (19—325–327)

SOURCE MATERIAL VIII, c

The Technical School at Mulhouse

By M. Bader, Director

From *French Commission on Technical Instruction*, 1865

This school was established by the city of Mulhouse for the professional (technical) instruction of the children of manufacturers and of persons in easy circumstances, and preparing them for an industrial career. At eight years of age, they are admitted, and can, if they please, remain until their eighteenth year; but in practice it is found that a large majority leave before

they attain that age, either to go to other schools or to enter business. The vacancies thus created are, however, soon filled up by others entering, so that the school maintains its average number. The course of education commences with six years of perfectly general instruction, about equivalent to that given in the Lycées and other secondary schools except that the dead languages are replaced by those of England and Germany. At the seventh year of their studies the pupils—then at the age of fourteen years—are divided into two divisions. The first consists of those who are only to remain at school for two years more, and are then to enter mercantile houses or the professions, and require no special technical instruction; these receive an instruction rather general than applied. The pupils of the other division remain at school for another four years, or to their eighteenth year, and receive an instruction partly general, the subjects of which are literature, history, mathematics, the physical and mechanical sciences, and drawing; partly special, which is divided into courses on the construction of machines, the textile fabrics, and the chemical arts. Besides this, there are workshops which the pupils of the second division attend for two hours every day. As soon as a pupil enters the school he commences the study of modern languages, which he learns to speak rapidly; and as regards geometrical and machine drawing, he is no longer allowed to copy as soon as he knows the use of his pencil. One of the great advantages of the system is that the pupil grows up in what may be called an industrial atmosphere, in the midst of machines and workshops. Far from having a foolish contempt of manual labour, he learns to hold it in esteem. He applauds his comrades who excel in that branch as much as if they had carried off the prize for literature or mathematics, and above all, he learns at an early age to make use of his ten fingers. The system has, however, also its inconveniences; the children get tired of remaining ten years at the same school, and the parents get tired of sending them. Thus it happens that the number of pupils in the last year but one scarcely amounts to 20, and in the last year to 10, and among these very few have commenced their studies at the school. For this reason, also, the pupils, who on an average number 300, are not divided equally among the 10 years; but lately this total has been decreased by the effects of the cotton crisis, the cotton manufacture, printing, and dyeing being the staple trade of Mulhouse and the district.

The terms of the school are 700 francs yearly for boarders, besides the cost of the schooling proper, which varies according to the division that the pupil attends or the special studies he may adopt. The school fee in the first three classes is 90 francs, then it rises to 120 francs in the intermediate classes, and finally to 200 francs in the higher; besides this, a fee of 200 francs is charged for attendance at the chemical laboratory, the mechanical workshop, or the weaving school. From the city of Mulhouse is received an annual grant of 6,000 francs. The governing body consists of the principal manufacturers of the city, chosen by the Minister of Public Instruction. As regards the social position of the pupils, they appear to be the sons of manufacturers, of managers of large works, and of professional men and Government employes. Of course the day pupils are inhabitants of the city, while the boarders come principally from the Department of the Haut-Rhin; besides which, the school is attended by about 20 foreigners from Switzerland, Germany, Holland,

Russia, Italy, and Spain. The pupils belonging to families residing in the district obtain employment on leaving school either in their fathers' houses or in those of firms connected with them by ties of business and friendship. Many of them who are in need of it are enabled at once to gain their own livelihood, obtaining appointments as assistants of the managers of machine workshops and cotton mills, while it has happened that some who have received a training in the school workshops have on leaving obtained employment at wages varying from 2 to 4 francs a day as fitters and forgers.

The practical training of the school is divided into three divisions. The first is given in the machine workshop, the second in the laboratory, the third in the weaving school; which latter, however, is distinct from the Professional (Technical) School. There is also a carpenter's workshop, in which a sort of preparatory training is given to the pupils of 12 and 13 years old, the object of which is not to turn out carpenters or joiners, but to give the pupils a taste for manual labour, and to form the hand and the eye; it may almost be considered in the light of an athletic exercise. The students attend in this shop only one hour three times a week, and are practised in planing, in making small articles of cabinet work, and at the lathe.

The machine workshop includes fitting, metal turning, forging, and mounting machines. The machine tools, which, as well as the four-horse power steam-engine, have all been made by the pupils, comprise forty fitting vices, three gearing lathes, a screw-cutting lathe, a drilling machine, and a small planing machine. This workshop is attended by the pupils for four years, two hours a day. They commence by learning to file and finish a piece of iron, then to make a square and other small tools. When they have acquired a certain amount of skill they are employed in the making and fitting of machines and tools used in the workshop itself. At the present time (1864) they are engaged in a large machine for planing iron. When the workshop is completely supplied with tools it is intended that the pupils should construct a collection of small models to serve as illustrations at the lectures. Already they have made a small steam-engine, which can be taken to pieces on the lecture table. The staff of the shop consists of an engineer, who has the chief direction, and who is at the same time professor of mechanics in the school; of a foreman, who instructs in fitting and mounting, the use of the lathe, and the forge; thirdly, of a stoker, under whose direction the pupils in turn learn to heat the boiler and to drive the engine; lastly, of a permanent apprentice, who, while learning his trade, is charged with the care of the tools and with keeping the shop tidy. All the expenses of this shop, including wages and fuel for the forge and for the engine, but not including the salary of the engineer-director, who is paid as professor of the school, amount to 600 francs a year. It may be noticed that these two hours of manual labour five days in the week do not prevent the students from acquiring as much knowledge of mathematics, physical sciences, etc., as they would obtain in the Lycées, class for class. This labour is rather a rest for the mind; to the extent it is carried on in the school it by no means hinders the pupil's progress in more serious studies. One of the features of the general scheme of instruction of the pupils in the mechanical arts, is that the training in manual labour and in drawing serve as an important aid to the courses of lectures in kinematics, on the steam-engine, and in the technology of railways. The same pupils must

attend the course of spinning, which is rather one on the construction of the spinning machine than on the process of manufacture. The same professor being charged with instruction in machine drawing and mechanics, and with the direction of the workshop, it is easy to see how these three subjects are worked together and assist one another. (12—87–90)

OPINION OF M. BADER OF WHAT IS NECESSARY TO RENDER TECHNICAL INSTRUCTION EFFICIENT IN FRANCE

Summing up what he thinks necessary for technical instruction in France, M. Bader says: "I ask for the working classes, properly so-called, schools in or by the side of the workshop. I do not deny that for certain particular industries, where the workman must almost be an artist, apprentice-workshops may be of great value; as, for example, in the clock and watch-making trade. But the more I observe the facts, and the more I study the question, the more it appears to me doubtful whether there would be any advantage in establishing apprentice-workshops for mere workmen; for they learn the special craft which they have to practice in the works where they are engaged far better than they could do in the workshop (always slightly artificial) attached to a school.

"On the other hand I take the intellectual culture of the working classes and the diffusion of scientific knowledge among them, as well as the development of industrial and artistic drawing, to be a subject of the highest importance. I desire that the schools attended by the young operatives should receive the highest possible organization, and that the instruction given there should be completed by courses of applied mechanics, physics, chemistry, and natural history, arranged in such a way that they may be attended by the workmen in the evening and during the hours of leisure.

"For young persons who are able to devote a longer time to school before commencing their apprenticeship, I recommend that (according to the resources of the locality) endeavour should be made to insure the complement of elementary education, that which was formerly called higher primary education (*instruction primaire superieure*), and which is intended for children of from twelve to fourteen years of age. Secondly, I believe, that for young persons who can remain at school to their sixteenth year, the regulation as to professional study lately promulgated by the minister of public instruction is in the right road; and I can say as much of the Turgot school.

"Lastly, for those who are to form the staff (état-major) of our industries, we must certainly have special schools, both industrial, commercial, and agricultural. These schools must be of different degrees of which the types as far as regards manufacturing industry are to be found in the Schools of Art and Trades, in the industrial section of the Professional School at Mulhouse, in the Central School of Arts and Manufactures, and in the School of Mines. Above all, in such schools as these it appears to me to be necessary that apprentice-workshops should be established, for the young men cannot as apprentices attend the workshops of the factories." (12—94, 95)

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CHAPTER IX

The Mechanics' Institute Movement

80. **The Mechanics' Institute Movement in Great Britain.** During the first three decades of the nineteenth century there was a definite movement among the common people of Great Britain to obtain more knowledge. This manifested itself especially among the group of intelligent industrial workers "who had been trained by the Industrial Revolution." They had developed a craving for knowledge, especially knowledge of a mechanical and scientific nature. (1—164)

Previous to this time there had been many more or less successful efforts to promote adult education. "The Sunday schools were the first to offer opportunities of continued or elementary education to adults and to young people whose school days were over. Historically, these schools developed from the ancient practice of catechising in church." (2—13) The first of the adult schools on an undenominational basis was opened in Nottingham in 1798. (2—17) About this same time there developed in England a marked interest in physical science due to new discoveries, inventions and their applications in agriculture and industry. Many local societies known as Literary and Philosophical societies were formed for mutual education. As a rule these attracted the professional and commercial classes of society. (3—19) But following close upon these were classes especially for mechanics.

The most remote link in the chain of societies established for the dissemination of a knowledge of the arts and sciences among the laboring people, was the "Sunday Society," formed by the teachers in the Sunday schools at Birmingham, in the year 1789, having for its object the instruction of young men in writing and arithmetic, after they ceased to attend the Sunday schools. To these studies were subsequently added geography, book-keeping and drawing, as well as moral instruction. A branch of this society formed a class for mutual improvement in useful knowledge, assisting each other in the construction of apparatus for illustrating the principles of mechanics, hydrostatics, electricity, pneumatics and astronomy. A few

works on scientific subjects were purchased and lent out upon the payment of a small subscription.

Some of the more intelligent members delivered lectures on mechanics and other branches of natural philosophy to the working classes, especially those engaged in the foundries and manufactories of the town. One member of the society, Mr. Thomas Clarke, held, at his own house, frequent meetings of these artisans who were known as the "Cast Iron Philosophers." These men, by their meritorious conduct, were also distinguished as the best workmen in the town. . . . The scientific information thus gratuitously imparted, failed not to create a taste for such pursuits, and led to the formation of a library, having for its object "the dissemination of knowledge by the aid of books among the working classes." This, the first artisans' library, was established in 1795, and by its rules provided that any operative might become a member on the payment of one penny per week. (4—29, 30)

At the opening of the nineteenth century Dr. George Birkbeck (1776–1841) was for about four years professor of "natural and experimental philosophy" at the Andersonian Institution in Glasgow. In the pursuit of his experimental work he was obliged to employ ordinary local workmen to make his scientific apparatus. "On one occasion he employed a tinman to construct a model of a centrifugal pump. It was in the cellar, which was the tinman's workshop that, surrounded by the workmen who were making the pump, he was struck with their ignorance as to its uses, and at the same time with their desire to obtain enlightenment. It was here that he first conceived the idea of giving a course of gratuitous lectures for the scientific instruction of the working classes. In the programme for this course which he drew up shortly after, he announced his intention of establishing classes 'solely for persons engaged in the practical exercise of the mechanical arts, men whose education early in life had precluded even the possibility of acquiring the smallest portion of scientific knowledge.' " (5—16)

The first of Dr. Birkbeck's lectures to mechanics "was attended by 75 persons; the second by 200; at the third, more than 300 workmen were present; and at the fourth, about 500." (5—21) (4—35) This experience of Dr. Birkbeck in the year 1800, is usually counted as the beginning of the Mechanics' Institute Movement, which made rapid progress both in Britain and America during the following third of a century. Dr. Birkbeck moved to London in 1804 where he became one of that city's leading physicians. Previously, while a student at

Edinburgh University, Birkbeck had made the acquaintance of Henry Brougham (1778–1868), later Lord Brougham. The friendship that grew up between them became an important factor in the later development of educational work among mechanics. Early in his public career Brougham interested himself in the education of the working classes. In 1816 he was made chairman of a committee of the House of Commons to inquire into "the education of the lower orders." This committee reported in 1818, and that same year there appeared in the *Edinburgh Review* Brougham's notable article describing the institution of Fellenberg in Switzerland. (cf. Source Material V, B) In the year 1825, in his address on "Practical Observations upon the Education of the People," Lord Brougham stated that his opinions on the education of the working classes were "grounded on actual observation of Fellenberg's establishment in Switzerland, that a high degree of intellectual refinement, and a taste for the pleasures of speculation, without any view to a particular employment, may be united with a life of hard labour, even in its most humble branches, and may both prove its solace and its guide." (6—II, 83) Moreover, Brougham believed that the benefits of education were so great that the expense should be defrayed mainly by those who received instruction. The rich should lay foundations but the workers should provide the support. He said: "Instruction in the principles upon which the arts depend will repay in actual profit to those who live by the arts far more than the cost of learning." (6—II, 57)

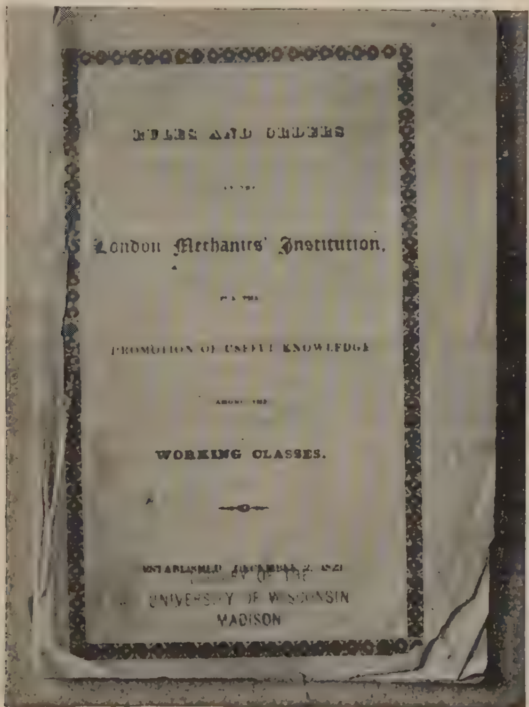
Growing directly out of the classes established by Birkbeck at the Andersonian Institute there was established in 1823 an independent institution, the Glasgow Mechanics' Institution, entirely under the management of the mechanics themselves. (Source Material IX, A) Two years previous to this time, however, in 1821, the Edinburgh School of Arts was opened for the purpose of giving "instruction to the laboring classes." The instruction the first year consisted of "two complete courses of lectures on chemistry and on mechanical philosophy." The courses of the second year included chemistry, mechanics, geometry, arithmetic, farriery, and architec-

ture. A class in mechanical and architectural drawing proved to be "highly successful."

In August, 1823, a weekly magazine, known as *Mechanics' Magazine,* was started in London to represent exclusively the interests of the working classes. This magazine was edited by Joseph Clinton Robertson and Thomas Hodgskin (1787–1869). One of the early numbers contained an article on the Glasgow Mechanics' Institute, and a proposal that such an institution be established in London. The article referred to what had been done by Dr. Birkbeck while he was in Glasgow. "Many letters in response to this appeal were received by the editors, among them being one from Dr. Birkbeck," expressing his willingness to assist in the formation of the proposed institution in London. (7—20) A meeting to consider the matter was held on November 11th in "the large room of the Crown and Anchor Tavern" in the Strand, one of the largest auditoriums in London. More than 2,000 persons attended the meeting. Dr. Birkbeck made the principal address. Lord Brougham was unable to be present but he sent a letter and a contribution of £20 to start the institution. (8—I, 177–192) There was, however, considerable opposition to the movement. "Not a single Tory attended the meeting or contributed to the support of the Mechanics' Instititition." (7—25) Because some of the men in the movement were social reformers it was feared by the Tories that it would result in the destruction of the empire. Others feared the study of mathematics would produce skepticism. (7—27)

Into the organization of this new institution Dr. Birkbeck put the result of years of observation and his experience in this new field of education. In the "Rules and Orders" of the Institute, Fig. 27, its object is stated thus: "The object proposed to be obtained is the instruction of the members in the principles of the Arts they practice, and in the various branches of science and useful knowledge." (9—5) The plan of the institution included a reference library, circulating library, reading room; a museum of machines, models, minerals, etc.; lectures on "natural and experimental philosophy," practical mechanics, astronomy, chemistry, literature and the arts;

"elementary schools for teaching arithmetic, algebra, geometry, trigonometry and their different applications, particularly to perspective, architecture, mensuration and navigation"; and "an experimental workshop and laboratory." (9—5) The Institution opened on the 20th of February, 1924. (7—29)



London Mechanics' Institution,

WORKING CLASSES.

FIG. 27. ONE OF THE FIRST STATEMENTS SENT OUT BY THE LONDON MECHANICS' INSTITUTE, 1823

The management of the institution was entrusted to six officers and thirty committee men. "Two thirds, at least," of the committee of managers of the Institute were to be taken from the working classes. (9—6) This, however, did not prevent it from being favored with the patronage of royal princes and men of wealth, among the latter being Lord Brougham. During the early years the enrollment often exceeded 1,000 members who paid an annual fee of 24 s. (3—III, 1048)

The average number of members during the first eight years was as follows:

1824— 750	1828—1100
1825—1389	1829— 929
1826—1477	1830— 950
1827—1225	1831— 941

(4—51)

The marked success of Dr. Birkbeck's institution in London and the publicity given to its proceedings caused the immediate spread of his ideas, and during the year 1824 similar institutions were opened in several cities both large and small in England and Scotland. The most important of these was the Manchester Mechanics' Institution whose building was "the first erected in England with accommodations for the various departments of its scientific work. It provided systematic class instruction in chemistry and mechanics. Its chief object was 'to point out and teach the scientific principles upon which the business of the machine-maker, the dyer, the carpenter, the mason and others depends.' " (2—25)

The mechanics' institutes continued to multiply during the next twenty years. In 1841 there were 216 in Great Britain, with 25,651 members, or an average of 119 members each. (10—398) But grave difficulties began to appear. One of the first of these was in securing competent lecturers. To help this situation, groups or unions of institutions were organized for the purpose of exchanging lecturers and interchanging opinions on questions of management (2—27), but the unions failed to meet the difficulties. (4—187) The second was far more important: Dr. Birkbeck, by "simplicity of expression and familiarity of illustration," had "attempted to teach science in such a way that its principles could be grasped by persons who had had no preparatory education." If he himself was successful, many other lecturers were not, and it soon became clear that many members were withdrawing from the institutions because they could not understand the lectures. These members lacked the essential elementary education. This difficulty was realized by Dr. Birkbeck so early in the movement that he included elementary schools in the original

plan for his institution in London. A few additional elementary schools for adults, however, could not stem the tide, and after 1848 the institutions declined rapidly. A third difficulty was due to the fact that, while the ideals of the founders in reaching the industrial workers were realized in a few cities, in most cases the membership was chiefly recruited from the commercial workers instead of the mechanics. Class distinctions in England were stronger than Lord Brougham and his fellow-workers had realized. (2—27)

An example of the wide distribution of membership is found in the following summary of averages per year covering seven years (1835–1841) at the Manchester Mechanics' Institute:

1. Merchants, manufacturers, artists, architects, engravers, professional men, schoolmasters, etc.	328
2. Clerks, warehousemen, etc.	374
3. Mechanics, millwrights, overlookers, spinners, mill hands, building tradesmen, etc.	309
4. Ladies	20
5. Youths	153
Total	1184

(4—131)

A fourth difficulty had its roots in the patronage of the wealthy. Manufacturers supported the institutions because they believed that by so doing they would get better workmen in their factories. Some of them insisted that the curriculum of these institutions be kept wholly utilitarian or technical in character. A few even went so far as to exclude newspapers, works of fiction, and general literature from the institute libraries. In Manchester, especially, there was a struggle over the admission of newspapers. (4—130) This influence of the patrons had been foreseen by the editor of the *Mechanics' Magazine*, and in reporting the first public meeting in London he printed in italics, "the mechanics should pay as well as they can for whatever instruction they receive," and in another place he exorted them to "think and act for themselves." (8—177) But gifts of funds for fine buildings and for support were acceptable, and along with the gift went the influence upon the management. And so controversies arose which

caused much internal trouble, especially in some of the larger industrial centers. Moreover, unwise financing of too fine buildings, resulting in heavy mortgages and the consequent obligation to pay large sums for interest, were too common.

As a natural result of these difficulties many of the mechanics' institutions died out; others "lingered on, often as little more than working men's clubs, until they were utilized as a nucleus for endowments, or till the spread of education developed a fresh need for them." (1—164)

It must not be concluded, however, that they were in fact a failure. Quite the contrary, for while many of them served a different purpose than was intended and while others ceased to exist after a few years, they demonstrated, as perhaps nothing else could have done, the positive need of the nation for a comprehensive scheme of elementary education that would be available to every child. (Source Material IX, B, and IX, C) Moreover, out of them developed colleges and schools of technical instruction which have rendered most important service to the local communities and to the nation. For example, the London Mechanics' Institute is now Birkbeck College of London University; the Manchester Mechanics' Institute developed into the great Manchester Technical College of the present day. Out of the mechanics' institutes grew many of the technical schools of the seventie's and eightie's such as Huddersfield, 1877, Keighley, 1870, Leeds, 1889.

Quoting from an article on "A Century of Adult Education" in the *Times Educational Supplement* for November 24, 1923:

> Year after year the institutes provided evening classes of astonishing variety; they collected libraries of serious books which were well circulated; they were, in many places, the sole means of satisfying the isolated workman's disinterested pursuit of knowledge. Some of them opened successful day schools for boys and girls and maintained them for many years. In the mutual improvement classes in the institutions many men wrote papers and discussed ideas for the first time. Other organizations, too, designed to give a cheaper and more popular education to the laboring classes, owed their origin to them.

While mechanics' institutes flourished for a time in Great Britain they never did get a corresponding start on the conti-

nent of Europe. Conditions there were less favorable. In Germany, where the compulsory education of children was common, also in Denmark and Holland for a similar reason, adult schools for teaching the common elementary branches were comparatively unnecessary, and evening technical instruction did not reach its important stage of development until a later period. At Hamburg, in 1848, a mechanics' institute, or *Bildungs-verein*, was formed for evening instruction. "Fifteen hundred members were enrolled, including the shoemender, the sweep, and the pavior of the public streets," but the institute was quickly broken up by the revolution. (4—215) In France, just as the Mechanics' Institute Movement in Britain was getting a good start in 1824, the government resolved to suppress schools of mutual improvement, fearing their political influence. (4—214) In America, however, the good seeds of the Mechanics' Institute Movement fell upon fertile soil and its development was more steady and rational than in Britain because in America there was the subsoil of a more adequate system of public elementary education.

81. **The Workingmen's Colleges in England.** Because there was a feeling that the mechanics' institutes had failed in their original purpose of providing for the working men the kind of education they wanted, and because of the rapid growth of more liberal social and religious ideals, especially in a group of university men and among the working men with whom they came in contact, another type of institution known as workingmen's colleges grew up in England. While these were not especially institutions for technical training and while they were only remotely connected with instruction in the manual arts, excepting drawing, they represent so many of the ideals for which the English-speaking people have labored to realize, that they have a very definite bearing on later types of industrial education in both Great Britain and America. They stood for the right of every man to do his own thinking irrespective of tradition or class or wealth or the established religion.

The first of the schools of this new movement, and the first school intended especially for working people to be called a "college," was started in Sheffield in the year 1842 by the

Rev. R. S. Bayley, an Independent minister. It was known as The People's College. He believed that the time had come when such studies as Latin, Greek, French, German, mathematics, English literature, logic, elocution, and drawing should be within the reach of the youth of the middle and working classes. The college occupied "a whitewashed, unplastered garret, not fitted up with the necessities, much less the conveniences, of study." (2—32) Classes were held between 6:30 and 7:30 in the morning and between 7:30 and 9:30 in the evening so that men could attend either before or after their day's work. Women, as well as men, were admitted. The tuition fees were 9d. per week.

The attendance kept up for a few years but gradually fell off, so that when Mr. Bayley left Sheffield for London in 1848, there were very few students left. There were, however, sixteen resolute young men, several of them under age, who had caught the vision of a college for working people under democratic management and they proceeded to appoint a committee of twelve of their own number to frame a new constitution for the college. They said that The People's College should be a *self-supporting* and a *self-governing* institution, that all persons above sixteen years of age should be eligible to become members, and that party politics and *sectarianism* should not be introduced into its classes. Mr. T. Rowbotham was elected president. When the constitution was adopted at a public meeting, it was stated that the college did not possess a book and had not a farthing to invest in furniture. To outsiders the project looked hopeless. Two men of means asked the committee to estimate the expenses for the first year so that they might "subscribe a portion and beg the rest." This offer, however, was respectfully declined. The principle of self-support had been laid down and they felt they must abide by it. (2—33) Before the end of the first month 200 students had joined the classes. Later, day classes were established partly as a feeder for the college. In 1853 the committee of management decided "that there was something more required for the artisans of Sheffield than purely mental discipline, however excellent that in itself might be, and that to be really a college for the people,

it must include in its classes studies that would have a direct bearing upon the industrial pursuits that distinguished the town." Following this, public lectures were given on chemistry as applied in the industries of Sheffield. In ten years the college collected and expended more than £4,000. (2—34)

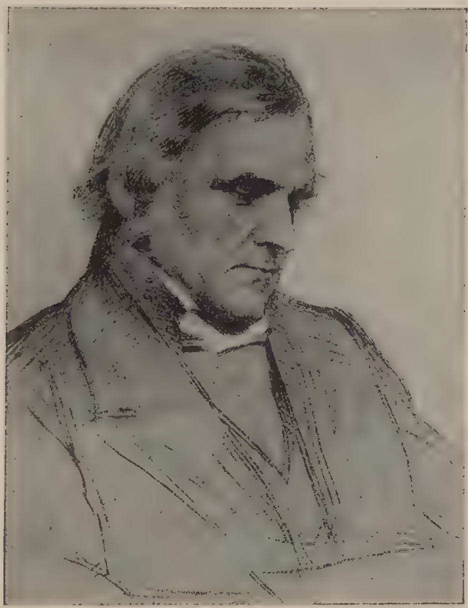


FIG. 28. FREDERICK DENISON MAURICE. FROM: *The Life of Frederick Denison Maurice,* BY FREDERICK MAURICE

But the real founder of the Workingmen's Colleges was Rev. Frederick Denison Maurice (1805–1872), and by far the most influential college representing the movement was the one he established in London. The political reformers known as the Chartists had come and gone so far as a political party was concerned, but in its wake there had developed organizations of workingmen and a group of university men and social reformers known as Christian Socialists, who were laboring to better conditions for the working people. Such was the group who gathered around Frederick Denison Maurice (Fig. 28), chaplain of Lincoln's Inn. In this group were Charles Kingsley (1819–1875), writer and professor of English literature, and later canon of West-

minster; Thomas Hughes (1822–1896), author of *Tom Brown's School Days* and other books; Frederick James Furnivall (1825–1910), noted English philologist and Shakespearean scholar; and other men of like interests, including barristers of Lincoln's Inn. Maurice had been a professor of divinity at King's College, London, but had been dismissed because he had written a book of theological essays in which, as was claimed, "the opinions set forth and the doubts expressed . . . as to certain points of belief regarding the future punishment of the wicked and the final issues of the day of judgment, are of dangerous tendency, and calculated to unsettle the minds of the theological students of King's College." (11—II, 191) Previous to this event the group of men of which Maurice was the leader had founded "The Society for Promoting Working Men's Associations" and had provided a "Hall of Association." Lectures and classes had begun there but only two, French and drawing, had been successful. (2—37) There was a lack of vigor and unity of action upon the part of the promoters which grew out of efforts to secure funds. Maurice stood for social unity and his great desire was to bring together social classes that had been alienated from one another. He feared that a sect of Christian Socialists might arise which would become separated from other men. (11—220) When, therefore, in 1853, he and his co-workers learned of the People's College in Sheffield and what it had accomplished, he looked with favor upon its plan. The name "college" especially attracted him because "it seemed to him to imply an association of men *as men*—an association not formed for some commercial purpose and not limited by coincidence of opinion, and to represent, therefore, that union which he was always striving to bring about." (11—221) These influences were pressing upon him for consideration at the same time that he was undergoing the trial of his faith at the hands of the Principal of King's College. It is easily understood, therefore, that when, in December, 1853, "a large body of working men met at the Hall of Association to present him with a testimonial, and in one of the speeches then made, a hope was expressed that he might not find it a fall to cease to be a professor at King's

College and to become the 'Principal of a Working Man's College,' " he acted upon the suggestion. (11—221)

In January, 1854, a committee of representative men interested in the movement, with Maurice as its chairman, agreed upon certain maxims, and then asked Maurice to outline a plan for the college. This he did in a printed statement submitted the following month. In this he gave the maxims prepared by the committee. The first of these was:

> Our position as members of society which affirms the operations of trade and industry to be under a moral law—a law concerning the relations of men to each other—obliges us to regard social, political or, to use a more general phrase, *human* studies as the primary part of our education. (2—40)

This is the keynote of the work of the Working Men's College and it represents the ideal which Maurice and his friends worked out, at a critical time in English social history, for the adult education of English working men and working women. (2—40)

In the first prospectus of the College was the following:

> The working men of England are trying, from various motives, and in various ways, to educate themselves. Some of them hope that their class may obtain greater influence in the legislature. They desire that it should qualify itself for that position by the study of laws and of history. Some of them think that there are many maxims of morality current among us which tend to divide and to degrade them. They wish to find out the true principle which binds men together, and shows them what objects they are to live for. Some are impressed strongly with the mischiefs that come to them from their ignorance of the causes which produce disease, and of the best means of securing health. Some wish to understand better the machinery with which they are working. Some feel what a blessing it would be to them if they could use their voices in singing and their hands in drawing. Some are puzzled with a number of doubts about the world within them and without them, which they dare not stifle, and through which they long to see their way. (12—325)

In reference to self-support and self-government Maurice would object to "any interference of patrons, ecclesiastical or civil" or of the "public, secular or religious" with the studies or the management of the college, but he felt that he must ask for their help. He believed that those who started the institution must exercise authority over it, but that by degrees this might be shared by others. In order to maintain his ideal Maurice thought that all instruction should be gratuitously

given, "all the fees going at first to the procuring of the necessary machinery for the institution." (2—42) At first only teachers were to be on the governing body, working men to be gradually admitted to the extent of one-third of the entire number.

Maurice explained the purpose and plan of the college in a course of six lectures which were published in a volume entitled *Learning and Working*. (13—8) In the last two he spoke in detail of the studies to be taken up and of the teachers. On the occasion of his inaugural address each visitor who entered the hall was presented with a copy of a reprint of Ruskin's "The Nature of Gothic," that famous chapter in *The Stones of Venice* in which art is defined as the expression of man's joy in his labor and the division of labor as the division of the laborer into "segments and crumbs of life." This was done, so it was said, "for the purpose of showing what sort of a fellow one of our teachers was." For John Ruskin (1819–1900) was the first teacher of drawing at the Working Men's College, and it was here, during the next three years, that he developed his *Elements of Drawing*, an instruction manual which had a great sale. It was written to guide beginners in looking at things they wanted to draw. (14—86) When Ruskin entered upon this work of teaching he was not personally known to any of the founders of the college. Dr. Furnivall had sent him a circular outlining the plan of the college and in response he sent a letter offering to teach a class in drawing. His coming to the college not only gave the art teaching a splendid start but helped the whole enterprise by "letting the world know that one of the greatest Englishmen of the time was in active sympathy with it." And it was through him that not long afterwards the art school of the College had the assistance of Burne-Jones, Rossetti, and other artists. (15—6) Thirteen classes were held in the opening session and a majority of the teachers had obtained honors at the universities of Oxford or Cambridge. This fact also had the effect of bringing public attention to the college. In the years that have followed, the Working Men's College in London has continued to render service in the spirit and on the general

plan laid down by Maurice and his co-workers. It has had "amongst its teachers, students and friends a crowd of men known in literature, politics and public service." (14—85) It has not been a technical or industrial college; in fact, it has been in opposition to the idea of giving technical instruction to working men merely to help them to earn more money. (Source Material IX, D) It has sought, rather, to give "human" instruction in social relations and to supply the longing of the working man for knowledge beyond his craft and the culture of educated men. Yet, in taking this stand and in living up to it, the College became an important liberalizing influence upon the schools for technical education which came later. Moreover, "it has been the parent of a long brood of colleges and societies more or less like it in purpose." (14—85)

In 1855 a Working Men's College was started in Cambridge; one in Manchester and another in Wolverhampton were opened in 1857; another in Manchester and one in Salford began in 1858; others at Halifax and Oxford in 1859, and one in Liverpool in 1860. (2—45)

As has been stated already, one of the outstanding classes at the London Working Men's College in the early days was the drawing class taught by John Ruskin. The course of study and methods of teaching adopted by Ruskin were quite at variance with what was then employed by the Government School of Design. In the latter school the students were required to go through "a long course of drawing from the flat before being permitted to draw from the round. Mr. Ruskin, on the contrary, did not give his students printed works to copy, but set them at once to draw from objects. A student, on his entry into the class, was set to make a drawing from a plaster cast of a sphere, Mr. Ruskin saying that a sphere was of so regular a form that even an untrained eye could perceive an error in the representation of it, and that, moreover, the gradations of its shadows were so regular that a beginner would find them the least puzzling for him to attempt. Having made a drawing of a sphere, the student would next be set to draw from a racket ball, which, being not so exact in form as a sphere, and also possessing a more variegated light-and-

shade, was a farther trial of the student's abilities, and led on to his making drawings from casts of leaves, then from real leaves, pebbles, minerals, and other objects of still life." (13—39) This method of teaching elementary drawing proved interesting at every stage in the work and it is recorded that "men who started without any knowledge of drawing" soon gained considerable "skill of delineation." (13—40)

The following incident as told by one of his pupils illustrates Ruskin's viewpoint concerning the purpose of the instruction he was giving:

> A man called there one evening and said, "Can you teach me how to draw a cart-wheel?" "I don't teach anything special or technical," said Mr. Ruskin, "I teach drawing in general, so that any one learning from me would have the power of drawing any object that's before him." "Yes, but that isn't what I want: I don't care about drawing for itself; I'm a wheel-wright, and it would be a great advantage to me in my business if I could make a drawing of a wheel just as I see it lying on the ground; and if you can teach me to do that, I'll come into your class." Mr. Ruskin again explained that he taught drawing in general, so that any one should be able to draw anything, whether a cart-wheel or other object, as it appeared to the eye, but that he could not undertake to teach anything that was in any way special. He asked his visitor if he (the visitor) wished to be able to make a drawing to scale, as, if that were the case, the School of Design would be the place for him. The visitor was very earnest, stolidly earnest, with but one idea, that of gaining the ability to draw a cart-wheel; that was all; he didn't wish to go through a course of drawing, and I believe that in the end he did not join Mr. Ruskin's class. (13—41)

Another incident told by the same student reveals Ruskin's attitude toward the teaching of color in its relation to drawing. One of his earliest assistants was Dante Gabriel Rossetti; another was Lowes Dickinson.

> Mr. Ruskin taught how to draw in black and white, but a section of the class was engaged in the study of colour, and of drawing and painting the figure, a section which was taught by Mr. Rossetti and Mr. Dickinson. "I understand what is good and what is bad colour," said Mr. Ruskin, "but I wouldn't undertake to teach it, and as to figure painting, it's a thing that requires a lifetime of practice." Mr. Rossetti much wished to have all the students in his class; "Mr. Ruskin'll spoil their eye for colour if he keeps 'em so long at that pencil and sepia drawing," he would say; while Mr. Ruskin would reply to some student who was ambitious of trying his hand at painting, "Yes, Mr. Rossetti is such a colourist that he wishes everybody to be the same, and would have people practise colour before they understand light-and-shade and how colour is affected by it." (13—44)

82. **Mechanics' Institutes in America.** While the educational movement among the common people of Great Britain was taking place during the first third of the nineteenth century, resulting in the philosophic societies, the mechanics institutions and more elementary schools for the poor, a corresponding development was taking place in the United States of America. Fundamentally, the movements in the two countries were the same; they were both a part of the great effort of the industrial and agricultural populations to better their social and economic condition through education, and of the ruling classes to build up an intelligent and efficient body of workers and citizens. But in so far as the political and industrial conditions in the two countries were different, the details of the movement varied. In general it may be said that conditions in America were more fluid because the country was new and the people scattered over a larger territory, consequently the movement here was less fixed and the institutions more varied in character.

The first important institution of this class in America came into being in the year 1820 when the General Society of Mechanics and Tradesmen of the City of New York opened a library for apprentices and established a "mechanics' school." This society itself was organized in 1785 by twenty-two representative mechanics, its primary object then being "mutual aid, assistance in case of sickness or distress, and care for the widows and orphans of those who should die without property." (16—5)

In the early part of 1820 an apprentices' library was opened in Boston by William Wood. Upon being appealed to by the officers of the New York society for information which would enable them to establish a similar library, Mr. Wood responded by coming to New York and devoting several months to assisting them. He visited the various workshops in the city, "consulted with employers, and obtained the names of 740 apprentices who desired to become readers. By his efforts, aided by the liberality of many members, in the donation of books and of money, a library was established temporarily in a school building that then stood on a part of the present site of City

Hall Park." This was opened on the 25th of May, 1820. (17—III, 303)

In order to understand why this society should establish a school for the children of mechanics, it should be recalled that the public school system of New York City was not established until 1853. Early in the nineteenth century there were a few "charity schools" under denominational or other control but a large number of children in the city were not supplied with means of instruction. In order to extend the benefits of education, several philanthropic men led by Governor DeWitt Clinton organized and obtained a charter for what was known as the Public School Society in 1805. This society adopted the Lancasterian System of instruction which was popular in England at that time and opened its first school in May, 1806. (18—2) With popular support this society multiplied schools and laid the foundation for the Board of Education that took over the schools in 1853.

Because the Public School Society was unable to meet all the needs, the General Society of Mechanics and Tradesmen established their own school in 1820. At first, attendance at the school was "confined to the children of indigent members, but afterwards other children were received at a small rate of tuition; but who paid and who did not was never known in the school. That was known only to the committee having the school in charge. The school was an excellent one. It was largely attended, popular, and for many years was self-supporting. It existed for thirty-six years, when, in 1858, it was discontinued in consequence of the general adoption throughout the city of the public school system. Upon its discontinuance, however, the present night school was established, which has proved even more successful in the free instruction of apprentices and journeymen, in architectural and mechanical drawing and in modeling for ornamental purposes." (17—III, 304)

In 1820 the society erected a building in Chambers Street for the library and the school. By 1833 it became necessary to secure larger quarters, and a building was purchased on Crosby Street. After forty-four years, more property was pur-

chased in Sixteenth Street. (17—III, 303) At the present time, 1926, it occupies a commodious structure in West Forty-fourth Street.

The second and the most famous of the mechanics institutes in America was the Franklin Institute of Philadelphia, named in honor of Benjamin Franklin, incorporated in 1824. The three following resolutions passed at its first public meeting indicate the original intent of its founders:

"*Resolved,* That it is expedient to form a Society for the promotion of the useful arts in Philadelphia, by extending a knowledge of Mechanical Science to its members and others at a cheap rate.

"*Resolved,* That the best mode of attaining this object will be by the establishment of *Popular Lectures*, by the formation of a cabinet of *Models* and *Minerals*, and of a *Library*, and by offering *premiums* on all useful improvements in the Mechanic Arts.

"*Resolved,* That the Society shall consist of Mechanics, Manufacturers, and others friendly to the useful arts." (19—8)

The two men who were most influential in starting the Institute were Samuel Vaughan Merrick (1801–1870), a young man of 23 years, who later became a manufacturer and still later the first president of the Pennsylvania Railroad, and another young man of 25 years, William Hypolitus Keating, who had been elected to the newly created chair of Chemistry and Mineralogy in the University of Pennsylvania. Professor Keating had just returned from Europe where he had completed his scientific training in France and Switzerland; he was acquainted with the work of the Andersonian Institute in Glasgow (cf. 80), and was "full of zeal for the diffusion of science applied to agriculture and the mechanic arts." (20—25) It will therefore be seen that Franklin Institute had the advantage of a strong scientific impulse at the start. It also had the advantage of being in a city that had already provided public elementary schools, these having been made legal in 1818. Yet it is clear that in Philadelphia as in London and other English centers, the greatest difficulty in developing a mechanics' institute was found to be that the mechanics who attended the lectures did not have enough fundamental education to enable them to get the full benefit of the scientific lectures that

were given at the Institute. In his report in April, 1826, the secretary says:

The audience at the lectures was always numerous and attentive, and it is believed that this important and prominent department of the Institute has not failed to prove eminently useful.

Still, it must be universally acknowledged that to receive the full advantage of a course of lectures, requires a degree of preparatory instruction, and a maturity of age, which many of our auditors do not possess. The great and fundamental object for which we were established, namely, to improve the condition and elevate the character of the operative class of society, by affording them the only effectual means for this purpose, *education*, cannot be accomplished by lectures alone. To attain this object effectually, we must commence at an early age, and it should be our aim to give to the children of our mechanics and manufacturers, who are generally in but moderate circumstances, the advantages of education which have hitherto been confined to the children of the rich, and which have ever constituted the choicest boon that wealth could purchase for them.

Impressed with these views, the Board established, nearly two years ago, a school for mathematics and one for drawing. But the schools are insulated, and do not constitute, as they ought, parts of a complete system of elementary education; and they have failed, from this cause alone, to fulfill the expectations which were formed at their commencement.

At present the necessity of adopting a more enlarged and perfect plan of education in the Institute seems to be universally felt; and accordingly at the meeting of the Board on the 6th of April, it was unanimously resolved, that it was expedient to extend the system of education according to the general outline of a plan reported by the Committee of Instruction; one of the leading features of which, is the establishment of a High School Department, in which the system of mutual instruction shall be introduced, and in which the elements of mathematics, drawing, geography, history, the Latin and Greek languages, and, when practicable, the French and Spanish shall be taught. (21—I, 377)

Two years later, 1828, the principal of the high school of the Franklin Institute, W. R. Johnson, wrote a short series of articles discussing the combination of a practical with a liberal course of education and describing the plan adopted at the Institute. In these he said:

In forming this school, it was the aim of the board, to give to the sons of tradesmen, and other citizens in moderate circumstances, the same advantages of education, which have heretofore been almost exclusively enjoyed by the children of the rich. In this country, where permanent distinctions of rank are inconsistent with the spirit of our republican institutions, it is impossible to tell, from the situation of the parent, what may be the destiny of the child. The board have therefore selected a course of studies such as

experience has proved to be the most useful for the advancement of the pupil in future life, and such as is universally selected by the enlightened parent, whose wealth enables him to make a choice for his son. Against the adoption of such a system, the only rational objection that can be urged, is the expense of time and money which it generally involves. But the modern improvements in education, and particularly the plan of monitorial or mutual instruction which is introduced into the High School, have nearly removed these difficulties. (22—VI, 57)

The course of study to accomplish this purpose Mr. Johnson says "consists of four important classes of studies, each of which has generally been confined to a separate school. The first includes *English* branches; the second *classical* studies; the third *modern languages*; and the fourth, *mathematics* and *practical sciences*."

The course outlined covers three years. The mathematics includes: First year—arithmetic, three quarters and algebra one. Second year—algebra, two quarters and geometry two. Third year—trigonometry, one quarter, mensuration and surveying one, and astronomy two.

Drawing is given in each of twelve quarters. It includes linear drawing (Fowle, cf. 99). one quarter; drawing mechanical implements in outline, two; drawing maps, one; elements of landscape, one; landscape drawing, two; drawing from models, one; drawing from machinery and laws of perspective, one; drawing from objects of natural history, two; and architectural drawing, one. "Each recitation occupies about forty-five minutes."

The science studies cover geography and the use of maps and globes, six quarters; "weekly exercises" in natural philosophy illustrated by lectures and experiments, four; explanation of the structure and use of machinery, one; and chemistry, with lectures and experiments, three.

During the last two quarters of the first year stenography is included among the weekly exercises.

Of modern languages, French, Spanish, and German are given. These were considered to be of equal importance, whether regarded as part of a practical or liberal education.

Concerning the fourth class of studies, mathematics and practical sciences, Mr. Johnson says:

All appeal, more or less directly, to the senses, and consequently excite the interest of youth more forcibly than subjects in which laws and relations are to be comprehended only by means of abstract and general expressions. Experience justifies this inference respecting their adaptation to the capacities of early youth.

Scarcely one of the numerous branches of industry in which our citizens now engage, can be successfully prosecuted for a single day, without involving the use of some one of these departments of practical science.

In the department of *drawing* the school is supplied with a collection of upwards of thirty original patterns, executed by Mr. W. Mason, in Indian ink, on large map paper, each 31 inches in length by 24 in breadth, and each including some class of tools, implements, furniture or utensils, represented in bold lines, easily distinguished at the distance of 50 or 60 feet. These constitute a series of exercises in linear drawing, graduated from very simple and easy to very complicated and difficult.

There is a neat collection of patterns, in the elements of landscape and figure drawing, consisting of about 120, each 12 inches by 8, likewise graduated and numbered, from the easier to the more difficult subjects. Patterns in natural history and architecture will soon be added to these collections.

In the department of *machine drawing* the models and apparatus belonging to the school, furnish abundant subjects of all degrees of difficulty.

The teachers have supplied themselves with collections of standard works on the subject of education, which are occasionally offered for perusal to young teachers and monitors, to aid their practice, and establish their principles in the business of instruction. The journals of the normal schools of France, the works of Bacon, Comenius, Locke, Dumarsais, Knox, Rollin and many others are frequently referred to either for general hints, or for practical illustrations of the methods of teaching in the several departments. (22—VI, 111–113)

From the above report it is clear that the Institute sought to broaden secondary education. While holding fast to classical studies as producing the best demonstrated results, the progressive men of the Institute placed alongside of these in the curriculum the most modern school subjects of the time which were suggested by the technical and science schools of Europe. The result was immediate popularity. It is recorded that there were 304 pupils in attendance in the following October. A summary of the registration is given as follows: Students taking English, 300; French, 153; Latin, 105; Greek, 35; Spanish, 45; German, 20; elocution, 300; geography, 240; drawing, 231; mathematics, 304—all students. (20—27)

"The school continued until 1832." (20—27) By demonstrating the need for such a school, it prepared the way for the Central High School which was opened in 1838.

FIG. 29. THE FRANKLIN INSTITUTE, PHILADELPHIA, 1825
FROM THE CENTENARY BOOKLET PUBLISHED IN 1924

The first professor of drawing at the Franklin Institute was John Haviland, architect, who designed the building erected by the Institute in 1825, Fig. 29, which now contains one of the largest and most important technical libraries to be found anywhere. (20—26)

The work of the Institute would have remained local and comparatively unknown had it not been for the establishment of the *Franklin Journal* in 1826 under the editorship of Thomas P. Jones, then secretary of the Institute. After 1828 it was known as the *Journal of the Franklin Institute.* This publication has appeared continuously since that time and for a century has rendered a notable service to science and the mechanic arts.

In 1825 a group of men in Baltimore, led by John H. B. Latrobe, and inspired by what was being accomplished in Philadelphia, founded the Maryland Institute. "They gave two exhibitions of articles of American manufacture, and yearly courses of lectures illustrated by excellent philosophical apparatus. They collected a library." (17—III, 134)

After ten years of work, in 1835, the entire property of the Institute was destroyed by fire and there followed a cessation of activity until efforts were made to secure a new charter, which was obtained in 1849. "Through the aid of the city council the Institute was provided with the use of a new and commodious building for exhibitions, lectures and an evening school." (17—III, 133) During the years since that time the Institute has rendered a great service to the young men of Baltimore.

In 1827 a mechanics' institute was organized in Boston. Its object was stated as "mutual instruction in the sciences as connected with the mechanic arts." (21—II, 187) The Boston society sought to avoid the difficulties that had arisen in England and elsewhere, due to lack of elementary education on the part of the members, by requiring the instructors to deliver their lectures "in a plain, intelligible manner, divested as far as practicable, of technical phraseology and such terms as tend to discourage rather than promote a love of science." (21—II, 58) In an address delivered at the opening of the Institute,

George Barrell Emerson (1764–1851) gave a brief history of the Mechanics' Institute Movement in Europe and America and emphasized its object which he said was "to give to persons, whose time is chiefly occupied with business or labor, knowledge of a kind to be directly useful to them in their daily pursuits." (23—7)

In the following year, 1828, the Ohio Mechanics' Institute was opened in Cincinnati. At that time Cincinnati was the largest city and the cultural center of the West. To this city came Dr. John D. Craig, who had been a teacher of natural philosophy in Philadelphia, and who had brought with him a valuable collection of demonstration apparatus. He was elected the first president of the Institute and began its work by giving a course of lectures on "the mathematical and physical sciences." (24—83)

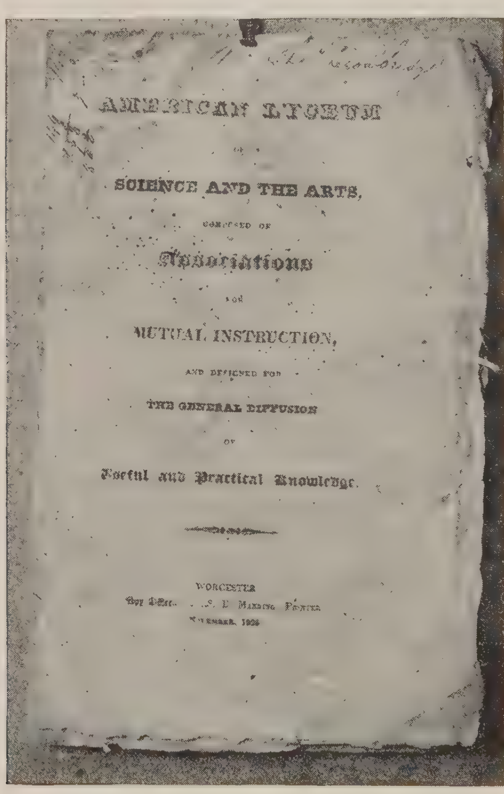
A statement concerning the scope and methods of the Institute published in 1841 reads thus:

A course of lectures is delivered every winter, occupying two or three evenings each week, upon all branches of Natural Philosophy, in regular courses. Classes are established for the prosecution of any study, whether of the Sciences or of the Ancient and Modern Languages, whenever any number of young men choose to organize themselves for this purpose; and they are taught upon the principle of mutual instruction; some important teacher giving his services in the commencement, to enable them to adopt the most suitable method of instruction. Occasional lectures are also delivered on various subjects upon the evenings not occupied by the systematic course. (25—251) In 1840 Dr. Craig returned to Philadelphia and was succeeded by Dr. John Locke. (25—251) It was said of Dr. Locke's lectures on chemistry that they "were made so peculiarly interesting that it was as difficult to persuade his class to disperse at a reasonable hour as to make pleasure-lovers at parties and balls do the same," and the writer added that "unfortunately the health of some of them suffered from this excessive zeal in the pursuit of knowledge. (24—86) As in other institutions of this type, one of the successful departments was that of drawing, especially architectural and mechanical. (24—85)

83. **The Lyceum Movement.** While the mechanics' institutes in America did not develop federations or "unions" as they did in England (cf. 80) a more or less similar plan was developed during this same period through what was known as the Lyceum Movement. The mechanics' institutes grew up in cities and these in America were far apart. On the other hand

the lyceums flourished in the small towns and needed the stimulus of federation.

In 1826 Josiah Holbrook (1788–1851) published a comprehensive plan of popular education to which he gave the title "American Lyceum of Science and the Arts." (Fig. 30.)



AMERICAN LYCEUM

OF

SCIENCE AND THE ARTS,

COMPOSED OF

Associations

FOR

MUTUAL INSTRUCTION,

AND DESIGNED FOR

THE GENERAL DIFFUSION

OF

Useful and Practical Knowledge.

WORCESTER

Fig. 30. Holbrook's Original Plan
In the Library at University of Wisconsin

While pursuing his course at Yale College from 1806 to 1810, Holbrook had come under the inspiring influence of Benjamin Silliman (1779–1864), chemist, geologist, physicist, and founder of the *American Journal of Science.* (26—430) For a few years, beginning about 1819, Holbrook was in charge of his father's farm in Derby, Connecticut. It was during this period that he developed the ideas which became the central

ones of his subsequent efforts, and he proceeded to put them to a test. Acting in co-operation with the Rev. Truman Coe, he opened on his own farm, in 1824, an agricultural and manual labor school. (27—VIII, 229) Here he taught "a popularized form of natural science." A letter written by Mr. Coe to Holbrook's son indicates that he sought to make the training of this school "plain and practical" yet thoroughly scientific. His ideal seemed to be to make "an agricultural school where the science of chemistry and mechanics and land surveying should be thoroughly drilled into the minds of the pupils by practice." (27—VIII, 229) "He did what he could to train the students in the analysis of soils, in the application of the mechanical powers to all farming operations, and took out our young men often into the field and country for practical surveying, geological excursions, road-making, and the labors of the farm." (27—VIII, 230) During this same time he was increasing his knowledge of science by attending lectures by Professor Silliman, at New Haven, riding over from Derby and back for the purpose. (27—VIII, 230)

The school did not last long—a little over a year—but during that short time Holbrook was convinced of the practicability of his plan for popular instruction in "useful and practical knowledge."

The publication of Holbrook's plan for an American Lyceum (Source Material IX, E) was followed almost immediately by his delivery of a course of lectures on natural science in the town of Millbury in Worcester County, Massachusetts. At the close of the course "he succeeded in inducing thirty or forty hearers, farmers and mechanics of the place, to organize themselves into a society for mutual improvement, which at his request was called Millbury Lyceum No. 1, Branch of the American Lyceum. (27—VIII, 232) Holbrook's plan of organization was to form town lyceums which would be members of county lyceums, and these in turn of state lyceums; and, finally, all state lyceums would form a national federation to be known as the American Lyceum.

In a short time a dozen or more towns in the vicinity had organized lyceums, and the following year, 1827, the Wor-

cester County Lyceum was organized. The work of organizing new lyceums went on rapidly in the New England states and somewhat in other states. (28—II, 36) In 1830 Massachusetts had its state lyceum, and in May, 1831, a national convention was held in New York City. At that time seven states were represented, a constitution was adopted, and Stephen Van Rensselaer (1765–1839) of Albany was elected the first president. Ten subjects were presented for discussion and several resolutions were passed intended to promote "seminaries for the education of teachers," higher salaries for teachers, and the daily reading of the Scriptures in the common schools, besides the routine business of the Lyceum. (28—I, 279) At the second annual convention, also held in New York City, Professor John Griscom (1774–1852) was elected president. At this meeting also a wide range of topics were discussed but they all centered around what was being done in the lyceums and the common schools to make popular education more effective—especially education in the sciences that might find application in the lives and occupations of the common people. At this time there were from 900 to 1,000 lyceums in the United States. The American Lyceum continued to hold such an annual convention until 1839 when a special convention was held in Philadelphia which terminated the public proceedings of the Lyceum. (26—430)

The Lyceum Movement gained the cordial support of many statesmen and prominent citizens. It extended into other countries. In England, after the mechanics' institutes had failed to reach the working classes, lyceums, which were less expensive to maintain, often took their places. This was especially true in the Manchester district where lyceums were started in 1838. (4—135)

Like the Mechanics' Institute Movement, the Lyceum Movement was a means of building up an American ideal of popular education; it placed emphasis on acquiring "useful knowledge." In those days the natural sciences as applied to agriculture and the mechanic arts were regarded as the best source of such knowledge. While the Lyceum Movement, as such, in America subsided after a few years, its spirit has continued in various

other organizations and has been a powerful force in keeping alive and directing interest in education. Coming, as it did, in the formative period of American education, its strength and value may have been in what was pointed out by an English critic of that time as its chief weakness. In the papers of the Central Society of Education of London, published in 1838, is one "On the Lyceum System of America, with a Consideration of its Applicability to Mechanics' Institutions in this Country" by T. Wyse, Esq., M. P., in which he says: "These institutions (American lyceums) are all small republics, self-born, self-governed; owning no external authority entitled to combine, much less to compress them. There is no central power of sufficient weight to act even as an intermediate." Likewise, the Mechanics' Institute Movement in America never had a closely-knit organization as in England, but it was none the less effective in helping to shape the institutions for practical instruction which followed it.

SOURCE MATERIAL IX, A

Early Days of the Mechanics' Institutes in England

By Henry, Lord Brougham

From *Sketches of Public Characters—Discourses and Essays,* 1839

It is now fit that we advert to the progress that has already been made in establishing this system of instruction. Its commencement was the work of Dr. Birkbeck, to whom the people of this island owe a debt of gratitude, the extent of which it would not be easy, perhaps in the present age not possible, to describe; for as, in most cases, the effective demand precedes the supply, it would have been more in the ordinary course of things, that a teacher should spring up at the call of the mechanics for instruction; but long before any symptoms appeared of such an appetite on their part, and with the avowed purpose of implanting the desire in them, or at least of unfolding and directing it, by presenting the means of gratification, that most learned and excellent person formed the design, as enlightened as it was benevolent, of admitting the working classes of his fellow-countrymen to the knowledge of sciences, till then almost deemed the exclusive property of the higher ranks in society, and only acquired accidentally and irregularly in a few rare instances of extraordinary natural talents, by any of the working classes. Dr. Birkbeck, before he settled in London, where he has since reached the highest station in the medical profession, resided for some time in Glasgow as professor in the Anderson College; and about the year 1800, he announced a course of lectures on Natural Philosophy, and its application to the Arts, for the instruction of mechanics. But a few at the first availed themselves of this advantage; by degrees, however, the extraordinary perspicuity of the teacher's method, the judicious selection of his experiments, and the natural attractions of the subject, to men whose lives were spent in directing or witnessing operations, of which the principles were now first unfolded to them, proved successful in diffusing a general taste for the study; and when he left Glasgow two or three years afterwards, about seven hundred eagerly and constantly attended the class.

For some time after Dr. Birkbeck's departure, the lectures of his able and worthy successor, Dr. Ure, were well frequented; and when the number of the students began to decline, probably from the circumstance of their having no direct share in the management of the Institution, the Professor happily thought of adding to it a library for the use of the mechanics, and entrusting the direction of it entirely to a committee chosen by themselves. This gave new life to the enterprise, and the Gas Light Company, having in return for some services rendered them by the Professor, agreed to light the book-room two evenings in the week, a custom arose among the men who came to change their books, of remaining to converse upon the subjects of their reading, and an extraordinary impulse was thus given to their spirit of inquiry. The Library Committee, too, being chosen by the whole body, became in some sort its representative, and claimed to interfere in the management of the Institution. It soon happened that some of their suggestions were not attended to; and a difference, at first to be regretted, led to consequences

highly beneficial; for a great number seceded from the lectures and formed an Institution entirely under the management of the mechanics themselves. It has been successful beyond all expectation; a thousand working men attended it last winter (1824), while the numbers of the parent establishment were scarcely diminished. Out of these public associations has arisen one upon a more confined but most useful plan, applicable to every large manufactory. The Gas Light Company's men, between 60 and 70 in number, have formed themselves on the suggestion of Mr. Nelson, the foreman, into a club for mutual instruction; laying by a small sum monthly, they have collected about 300 volumes, and the Company giving them a library room, which they light and heat, the men meet every evening to converse upon literary and scientific subjects, and once a week to lecture; anyone who chooses, giving a fortnight's notice that he will treat on some subject which he has been studying. The books are of all kinds, with the exception of theology, which from the various sects the men belong to is of necessity excluded.

It is somewhat singular, that although there are many towns in Scotland, and some within a short distance of Glasgow, where hundreds of artisans are collected, yet twenty years elapsed before the example was followed, and men profited by an experiment, which, for so long a period, was constantly before their eyes, and attended with such remarkable success. It was not till the year 1821, that Edinburgh adopted the plan with some variations, a part of which appear to be improvements.

The promoters of the measure began by drawing up a short sketch of the proposed Institution, and causing it to be circulated among the principal master mechanics, with a request that they would read it in their workshops, and take down the names of such of the men as were desirous of being taught the principles of those sciences most useful to artisans. In the course of ten days, between 70 and 80 names were entered; and a private meeting was held of a few gentlemen who were disposed to encourage the experiment. These resolved to begin a subscription for the purpose. In April, 1821, they circulated a prospectus among the mechanics, announcing the commencement of a Course of Lectures on Mechanics, and another on Chemistry, in October following,—with the opening of a Library of Books upon the same subjects, for perusal at home as well as in the room; the hours of lecture to be from eight to nine in the evening, twice a week for six months; and the terms of admission to the whole, both lectures and library, fifteen shillings a-year. A statement was then issued to the public at large, announcing the establishment of a "School of Arts," with the particulars of the plan; and so well was it received, by all classes, that in September, notice was given of 220 mechanics having entered as students, and such a sum having been subscribed by the public, as enabled the Directors to open the establishment in October. When 400 had purchased tickets, the two courses of lectures were delivered by Dr. Forbes and Mr. Galbraith; to which one on Architecture and one on Farriery were added with a class for architectural and mechanical Drawing during the summer recess.

The Mechanical Lectures had hardly begun, when some of the students, finding the want of mathematical knowledge, proposed to form themselves into a class, under one of their own number, a joiner, who had agreed to teach them gratuitously the Elements of Geometry, and the higher branches of

Arithmetic. This suggestion was warmly approved of by the Directors, and some assistance in books being given, thirty met once a-week for Geometry, and once for Arithmetic; and adopting the plan of mutual instruction, they arranged the class in five divisions, each under the best scholar as a monitor, and going over in one night the lessons of the night before. The number of this class being limited to thirty, those who were excluded formed another on the same plan, under a cabinet-maker, also a student of the School of Arts. The joiner's name is James Yule; the cabinetmaker's, David Dewar; and their successful exertions to teach their fellow-workmen are deserving of very great commendation. Mr. Galbraith, the Mechanical Professor, adopted the plan of setting exercises to his pupils; and a list has been published of those who chiefly distinguished themselves by the number and accuracy of their solutions, being 25 persons. . . .

As nothing can be more useful to the community of that great and enlightened city than the formation of this establishment, so nothing can be more honourable to the inhabitants than the zeal and the harmony with which all ranks have united in conducting it, and all parties among the rich in giving it their support. . . .

The complete success of Dr. Birkbeck's plan, both at Glasgow originally, and afterwards in a place abounding far less with artisans, very naturally suggested the idea of giving its principles a more general diffusion by the only means which seem in this country calculated for universally recommending any scheme—its adoption in London. An Address was published by Messrs. Robertson and Hodgkin, in the *Mechanics' Magazine*, October, 1823; and the call was answered promptly by Dr. Birkbeck himself, and other friends of education, as well as by the master mechanics and workmen of the metropolis. A meeting was held in November; the Mechanics' Institution was formed; a subscription opened; and a set of regulations adopted. Of these, by far the most important, and one which in common, I believe, with all my colleagues, I consider to be altogether essential, provides that the Committee of Management shall be chosen by the whole students, and consist of at least two-thirds working men. (6—II, 66–73)

SOURCE MATERIAL IX, B

Some Results of the Mechanics' Institutes in England

From *On the Examinations of the Society of Arts.* By the Rev. J. Booth, LL.D., F.R.S, in Transactions of the National Association for the Promotion of Social Science, 1857.

The credit of opening the first mechanics' institution may be with justice given to Dr. Birkbeck, who, upwards of fifty years ago, established a mechanics' institution at Glasgow, and afterwards was chiefly instrumental in founding the London Mechanics' Institution, in Southampton Buildings. In promoting the establishment of this and similar institutions he was ably assisted by Lord Brougham, Mr. Leonard Horner, Sir Benjamin Heywood, Sir John Herschel, and Dr. Ure. In less than two years after the opening of the London Mechanics' Institution similar societies were established in Aberdeen, Dundee, Leeds, Newcastle-on-Tyne, Alnwick, Dunbar, Lancaster,

Manchester, Birmingham, Norwich, Devonport, Plymouth, Portsmouth, Ashton, Bolton, Hexham, Ipswich, Lewes, Louth, Shrewsbury, Halifax, Hull and other towns.

Mechanics' institutions may be said, in a certain sense, to have failed, inasmuch as they have not in general reached the particular classes for which they were originally designed. But it may be urged in reply, that if they have not succeeded in their primary object, they have accomplished others not less important. While mechanics' institutions have in many instances been disregarded or abandoned by those for whose benefit they were founded, in almost all they have been supported by the middle and commercial classes, and thus they have served to reveal and supply a want previously unsuspected. Had the mechanics' institutions not been upheld by these classes, they must soon have been closed, while in many cases they never would have been opened.

This appropriation of the advantages offered to the lower classes by those immediately above them may be seen in the circulation of the cheap works prepared by the Society for the Diffusion of Useful Knowledge for the instruction of the poorer classes, who availed themselves of these books but to a very limited extent, while the circulation proved to be very large amongst those for whom they were not originally designed.

Again, it has been alleged that mechanics' institutions have not answered their purpose because the attendance at lectures has so fallen off, and that the diminished funds will not admit of the employment of paid lecturers in science and other useful knowledge. But the managers of these institutions ought not to have anticipated that the members, who for the most part were ignorant of the very elements of science and of the first rudiments of useful knowledge, would take a lasting interest in things entirely beyond their comprehension. . . .The lecturing system, as regards science, has been a failure, and it would indeed have been very strange had it been otherwise.

But the great work which the mechanics' institutions have accomplished will be found to consist not so much in the actual improvements they have effected in the education of the people, though even here their labours have not been without success, nor yet in the improved habits they have been so instrumental in introducing, as in the thorough conviction they have impressed on the mind of the nation that the rate and tendency of our future progress must chiefly depend on the improved habits and the greater enlightenment of the people, and that these can effectually be secured only by a much wider and more thorough system of education than exists at present. All their lectures, and discussions, and social meetings gravitate to this conclusion. This is now the established creed with respect to social progress, and no public man ventures to gainsay it. No candidate for a seat in the Legislature, whatever may be the bias of his private opinion or the hue of his politics, claims public support on the ground of his opposition to national education. On this question the nation has made up its mind, and will not argue. The practical difficulty, however, is to bring discordant opinions into harmony, at least so far as to uphold some determinate course of action. . . .

. . . the mechanics' institutions have been of great service by their tendency to bring different classes together who never meet but in a place of worship or in a lecture room. . . .

It was naturally to be expected that the institutions of the same county or of adjoining counties should form themselves into unions or local associations, for the purpose of coöperation and mutual assistance. Several such unions have been formed, of which the oldest and the most flourishing is the Yorkshire Union, comprising upwards of a hundred and thirty institutions projected many years ago by its present president, Mr. Edward Baines. The Society for the Diffusion of Useful Knowledge attempted, but without success, to establish a national union of these societies. They thus continued without any comprehensive organization until the year 1852, when, on the proposal of Mr. Harry Chester, the Society of Arts, at a general meeting held in its house in the Adelphi on the 18th of May, in that year, under the presidency of the Marquis of Lansdowne, inaugurated a general union of the mechanics' institutions of the United Kingdom.

This union now includes 400 mechanics' institutions, comprising the largest and most flourishing of these societies. The chief advantage anticipated from the union—a cheap and uniform supply of lectures to the institutions—has not been realized, or rather has not been required. Other advantages, which seemed at first only incidental, have grown into importance. A gradual change has been taking place for some time past in the character and objects of these bodies. More attention is now given to classes for continuous courses of study and systematic instruction is gradually superseding the desultory information conveyed in the occasional lecture. They are every day more and more assuming the functions and discharging the duties of "people's colleges." The tendency in this direction has been strengthened by the system of periodical examinations instituted by the Society of Arts, with a view to give full development to this important feature of those establishments. . . .

The Council of the Society not having found that demand for lectures on the part of the institutions which they were led to anticipate, and being besides aware that many of the institutions were in a most unsatisfactory position, that but little regard was paid to class-teaching, and that several were fast lapsing into places of mere amusement, determined to institute an inquiry into both matters, and at an ordinary meeting of their body, held on Wednesday, the 19th of January, 1855, resolved to appoint a committee, "to take into consideration, and to report how far and in what manner the Society of Arts may aid in the promotion of such an education of the people as shall lead to a more general and systematic cultivation of arts, manufactures and commerce—the chartered objects of the Society."

This committee sent out a letter which contained eight specific suggestions. The first of these were:

1. The improvement of the endowed grammar schools, more especially of those which are intimately connected with the universities; to enlarge them, so as to introduce among the subjects taught the elements of industrial instruction.

2. The conversion of the present mechanics' institutions, where practicable, into industrial colleges. (12—145–147)

SOURCE MATERIAL IX, c

Aims and Results of the Mechanics' Institutes in England

From *The History of Adult Education*, by J. W. Hudson, Ph. D., Secretary of the Manchester Athenaeum, Founder of the Scottish and Northern Unions of Literary and Mechanics' Institutions, 1851.

It is interesting to trace the career of the popular Literary Societies of the country, and to compare their operations and their results with the expectations entertained by their first promoters. The founders of Literary and Mechanics Institutions assumed that these associations would effect three great purposes. *First*, the rapid promotion of general science by the greater number of persons engaged in the observation of its phenomena. The lower ranks, who are chiefly engaged in manual labour, have frequent opportunities of making observations on certain peculiarities in the processes of art, which often escape the notice of observers of a superior rank, and thus the labouring classes of society would be rendered mutually useful, in uniting and concentrating the scattered rays of genius, which might otherwise be dissipated and lost to the scientific world. *Second*, an extensive diffusion of rational information among the general mass of society. For by means of lectures and popular discussions, those narrow conceptions, superstitious notions, and vain fears, which so generally prevail among the lower classes of society, might be gradually removed, and a variety of useful hints and rational views suggested, promotive of domestic convenience and comfort. *Third*, the creation of intellectual pleasures and refined amusements tending to the general elevation of character. The frequent intercourse of men of different parties and grades of life, for the purpose of promoting one common intellectual object, gradually vanquishing those prejudices and jealousies which almost universally exist, even in cultivated minds, is unquestionably an object to be cherished and encouraged. By such means a taste for rational enjoyments may be produced, and those hours generally spent in listlessness and in foolish amusements, may be converted into periods rendered precious by the inculcation of enlightened and elevating principles. Habits of order, punctuality, and politeness, would be engendered and flow from thence into all the other relations and departments of life.

Mechanics' Institutions, by constant modification, as well as extension of system, have in a quarter of a century effected an entire change both in their leading principles and in the class of persons ruling and attending them. The primary object for which these societies were originally established was the instruction of the working men *in the arts they practice*, and more especially in those branches of science which are applied in so many forms to the local manufactures of the great provincial towns. The preambles to the rules and constitution of the principal Institutes afford undeniable evidence upon this point. In numerous instances these preambles have been quietly suppressed, when it has been found that the object sought could not be realized.

Preamble of the Manchester Mechanics' Institution

This Society was formed for the purpose of enabling Mechanics and Artizans of whatever trade they may be, to become acquainted with such branches

of science as are of practical application in the exercise of that trade, that they may possess a more thorough knowledge of their business, acquire a greater degree of skill in the practice of it, and be qualified to make improvements and even new inventions in the Arts which they respectively profess. It is not intended to teach the trade of the Machine Maker, the Dyer, the Carpenter, the Mason, or any other practical business, but there is no Art which does not depend, more or less on scientific principles, and to search what these are, and to point out their practical application, will form the chief objects of this Institution. The mode in which it is proposed to accomplish these purposes is, in the first place, by the delivery of Lectures on the various sciences, and their practical application to the Arts of these lectures. Mechanical Philosophy and Chemistry will, of course, be leading subjects; and when their general principles, and those of other important Sciences have been made known, more minute and detailed instruction upon particular branches of Art, will form the subjects of subsequent lectures. It is intended that a suitable Library shall be formed for circulation and reference, and that there shall be a collection of Models, Instruments, together with *an experimental Workshop and Laboratory*. It is hoped, also, that instruction may be given in the elements of Geometry, in the higher branches of Arithmetic, and in Mechanical and Architectural Drawing.

The preamble of the London Mechanics' Institution defines the object of the society to be "the instruction of the members in the principles of the arts they practice, and in the various branches of science and useful knowledge; by means, *First*, of the voluntary association of mechanics and others; *Second*, of donations of money, books, implements, and apparatus; *Third*, a library and reading room; *Fourth*, a museum of machines, models, etc.; *Fifth*, lectures; *Sixth*, evening classes; and *Seventh*, by means of an experimental workshop and laboratory."

The workshops of the London, the Manchester, and the Newcastle Mechanics' Institutions had a short career; and indeed wherever industrial education has been attempted in these institutions it has proved a signal failure. Several societies are rich in philosophical apparatus, in working models of machinery, and in cabinets of minerals; but these stores, if not absolutely valueless, have been comparatively useless. Manchester, Leeds, Glasgow, and London, have each collections of this nature, on which the dust has been long accumulating. On the other hand, the formation of chemical laboratories (where the entrance to them has not been barred by heavy fees) have realized all that could be anticipated, or that their capabilities would allow. The Chemical Classes of Leeds, Bradford, Wakefield, Manchester, Westminster, York, Glasgow, and Newcastle, are just examples of the general taste for chemical science.

Lectures have met with a premature decay. The elder Institutions made their engagements for long and complete courses in each branch of science—somewhat of the character of university lectures, with examinations testing their usefulness, and taxing the attention of their auditory. From complete courses of ninety and sixty lectures upon one branch of physical science, lectures have dwindled to an average of three in each course, and a general practice of having one lecture for each branch of science. In the choice of subjects the change has been equally unfavourable; the plain and easily

understood discourses on the elements of the sciences, and their application to the useful arts, illustrated by numerous experiments, have been abandoned; and the preference shown for light literature, criticism, music, and the drama, has given just occasion for the statement, that even the elder Metropolitan Mechanics' Institution, since its establishment, has given more attention to *the Drama* than to the entire range of physical science.

The management of these societies was at first exclusively confined to Committees, chosen from the donors and patrons, who from being non-participators in the intellectual advantages afforded by each Institution, although very suggestive, were not the best qualified to meet the requirements of the members.

The most important feature in the Mechanics' Institution has ever been the evening classes. The formation of this department was an immense improvement upon the old "night schools," which were generally conducted by one master, who was surrounded by his pupils, engaged in dissimilar tasks at the same time—thus one would be writing, another learning grammar, a third geography, and a fourth at arithmetic. The regulations of a Mechanics' Institution, on the other hand, are definite. The studies are undertaken at fixed periods, and one subject alone entertained at a time, with the exception of mathematics, which, as an advanced study of arithmetic, and generally attended by *few* pupils, is carried on in the Arithmetic Class; and in the Drawing Classes, where the practice of architectural, geometrical, and mechanical drawing, is pursued by the pupils side by side. (4—54–58)

SOURCE MATERIAL IX, D

The Spirit of Working Men's College

From *The Working Men's College* by R. B. Litchfield

One leading feature of the College was that it wholly rejected the idea that the value of Education turns upon its usefulness in regard to a man's trade or profession, or in other words, upon its helping him to "get on." The plea addressed to working people by speakers or writers urging the importance of education was then most commonly of this kind. They would say, in effect, though wrapping it up in finer phrases: "Education will put you in the way of *improving your position.* If you are a clerk, for instance, knowing French may make a difference of ten shillings a week or more in the salary you can earn. Or, if you are an engineer, think of Stephenson and Arkwright. By being ingenious mechanists, they made great fortunes; they rose out of their class. Study mechanics, and you may do the same." This plausible doctrine Maurice would have none of. He always insisted that if knowledge and culture, science and literature are any good, the good is something apart from trade utility. He denounced, too, the pitiful fraud of dangling before the working man the prospects of "rising out of his class," when we know that this ambition, whether we call it worthy or unworthy, can succeed in only one in ten thousand cases. It was in this view, mainly, that for a long time we treated "technical" classes as outside of our province. And the principle was sound, though it is true that at that time the vast importance of improved technical education was not understood. Another distinctive feature

was our relying to a great extent on unpaid teaching. The drawbacks and difficulties incident to this were soon felt, especially as regards the modern language classes, which soon became too large and numerous to be adequately managed and taught by men able to devote to them only the leisure hours of busy lives. But the unpaid teaching, nevertheless, brought with it advantages which went far to outweigh its obvious deficiencies. It at once put the relation between teachers and taught on a high ground: emphasizing the principle of mutual help and mutual obligation on which the College was founded. (College men will not suppose that, in saying this, I am forgetting how much they have owed to the unwearying devotion of our professional teachers.) That it should have been possible to get a constant succession of able volunteer teachers during nearly fifty years is perhaps surprising; but it certainly is the fact that, whenever there has been a real and sufficient demand for teaching in this or that subject, there has rarely been a difficulty in finding the teacher. Classes have failed more often for lack of students than from lack of teachers.

Maurice insisted, too, on the significance of the word "College." He clung to it as importing a constant reminder of the intimate fellowship which was to bind together the teachers and the taught, a body of men "united together," to use his own words, "for high ends by other than mercenary bonds." All who knew the College in its early days will agree that the spirit expressed in these words soon began to be characteristic of the place; and such it has remained ever since. No one person, I think, in those early days, did so much to impress this character on the College as Tom Hughes. As a teacher he did not do much, for his Law class or classes did not "draw"; but he had a boxing class which was a great success, and his genial companionship with the men gave a great spurt to our social life. (It was about two years later that *Tom Brown's School Days* made him famous.) I shall always remember him best as presiding at a weekly gathering of teachers and students in the Coffee Room, whereat everybody talked to everybody, and songs and recitings of poetry went round the table. It was rather like what used to be called a "harmonic meeting," save that there was no drink better than tea; for years passed before we ventured, after immense debate, on what was thought at that time a daring measure in an institution of our sort, allowing a man to have a glass of beer with his supper. These gatherings, held in a grim attic at the top of the house, were an excellent means of bringing teachers and students together out of class hours. The same songs were sung over and over again. Two special favourites, I remember, were "The Tight Little Island," the property of a much-beloved brush-maker, Hurst, of the Latin class (who died in early middle life); and Hughes's "Little Billee," the funny song of Thackeray, describing the adventure sof the "Three Sailors of Bristol Citee," who "took a boat and went to sea." This we were never tired of calling for. But it was the solid strength and simple manliness of Hughes's character, and not only the genial temper shown in these convivial meetings, that won him the attachment which made him a governing influence.

Not all teachers could spare time for mixing with students out of class time, but it soon became a settled tradition that the teacher should aim at knowing his men. Two things helped to promote this intimate fraternization.

One was that in the early time we were nearly all, broadly speaking, young together.* Another was the gradual sharing of the teaching work by students and ex-students. This began with the institution of "tutors" and "practice classes," to give men special help supplementary to the regular teaching, and of "Preparatory classes" to help on the less advanced students. In time a large part of the teaching, and of the management too, was done by men who had entered as students; and now for many years past these have formed a majority among the men sitting round the Council table. All which has impressed on the College a character which, so far as I know, is not to be found elsewhere.

One name to be specially remembered in recalling the first days of the College is that of Charles Kingsley, notwithstanding that, when it was once started, he took no part in its regular work. His duties as Rector of a country parish forty miles away forbade that; but during those five years (1848–53) of the Co-operation and "Christian Socialist" movement out of which the College grew, he played therein a leading part. That movement has had after effects far greater than any that were visible at the time. He threw himself into it with passionate ardour. One might then have called him the voice of Maurice to the general world; and it was a voice to which the world had to listen. "A genuine poet," Sir Leslie Stephen calls him, "if not of the very highest kind." (Where, indeed, can we find a thing more absolutely perfect of its kind than the four stanzas of "The Sands of Dee"?) He was denounced in the "religious" and tory papers as a revolutionary and a Chartist; while he was, as a fact, working his hardest to stop the mad schemes of the "physical force" agitators. I well remember the immense stir made by *Alton Locke, Tailor and Poet,* a great book, in spite of obvious faults. It came as a trumpet-call to the conscience of all England. If a young man wants to get a vivid impression of the condition of working people at the birth-time of the College, and of the vast change which has come about in fifty years, *Alton Locke* will give it him.

I will not attempt to go over the long roll of College teachers, nor would it be of material interest to single out those among them who have become eminent in various lines of life. One thing which the retrospect brings to my mind is the great change which time has brought about in the general feeling as to volunteer work of this kind done by well-to-do people for the benefit of the less fortunate. In the early fifties, when the College came up in conversation, it was, I remember, often plain that one's friends looked upon the scheme as more or less of a freak; it seemed so odd that we should be troubling ourselves about such things as teaching algebra or English composition to working people. In the chambers of an Equity Draughtsman where I was a pupil, I got the nickname of "The Professor," by reason of my teaching in Great Ormond Street, a little joke which in these days of Toynbee Halls and University Settlements would have no point. The great spread of this kind of effort has made the thing familiar; and I doubt not that the state of feeling which leads so many men now to join in it is in a great measure

*The following were the ages (in 1854) of the first set of teachers and managers: Hughes, 31; Davies, 28; Furnivall, 31; Dickinson, 33; Ruskin, 35; Ludlow, 33; Mansfield, 35; McLennan, 27; Westlake, 26. I was the baby of the group, 22. Maurice was then 49; Kingsley, 35; Vansittart Neale, 44.

the result of Maurice's influence, transmitted through various channels of which the men affected thereby are unconscious. And, though technical education formed no part of the scheme he propounded, it is still the fact that the College played the part of pioneer in the movement which some thirty years later resulted in the establishment of the great London Polytechnics.

Of Maurice himself as a man, I hardly like to write; it is so difficult to put into words the kind of feeling which he inspired among those who came under the spell of his potent personality. From the wonderful face which looks at us out of Mr. Dickinson's magnificent portrait, there shone out the expression of a very great soul—one of the great souls to know whom is to feel the divine in man. In his presence—this is the most enduring impression I keep of it—it seemed as if everything petty or trivial, every small or unworthy thought, must needs shrivel up and vanish. It was not easy to know him well; he was shy, and had something of constraint in his manner, and few, I imagine, were closely intimate with him. But a very little intercourse sufficed to make one feel the nobility—I would rather call it the grandeur—of his character. Men of all beliefs and of no beliefs felt this equally. Perhaps the secret of the personal influence whereby he drew men to him and to each other, was the intense reverence he had for man as man, without regard to the thousand minor diversities of rank, occupation, race, ability, or outward circumstance. In deeds, his was a very noble life. He gave himself unsparingly, without thought of self, to work for others, and was wholly, I should think, without consciousness of his own greatness. Kingsley said of him, "He was the most beautiful human soul I have known"; and Gladstone summed him up truly when he called him, in the words used by Dante of Saint Dominic, "that spiritual splendour." (15— —)

SOURCE MATERIAL IX, E

American Lyceum of Science and the Arts

From the announcement prepared and distributed by Josiah Holbrook

THE undersigned agree to associate, under the name of The . . . Branch of the American Lyceum of Science and the Arts, and adopt the following Articles for their Constitution:

Art. 1.—The object of the Association is the improvement of its members in useful knowledge, and to aid in diffusing it generally through the community.

Art. 2.—To effect this object, they will hold meetings for the purpose of investigating and discussing subjects of knowledge, and may choose for discussion any branch of Natural Philosophy, such as Mechanics, Hydraulics, Pneumatics, Optics, Chemistry, Mineralogy, Botany, the Mathematics, History, Geography, Astronomy, Agriculture, Morals, Domestic or Political Economy, or any other subject of useful information.

Art. 3.—As it is found convenient, they will procure books and apparatus for illustrating the sciences, collections of minerals, or other articles of natural or artificial production.

Art. 4.—Any person of good moral character may be a member of the Lyceum, by paying into the Treasury, annually, One Dollar; and Ten Dol-

lars, paid at any one time, will constitute a person a member for life. Persons under eighteen years of age will be admitted to all the privileges of the Society, except of voting, for one half the annual sum above named.

Art. 5.—The monies collected for membership, or otherwise, shall be appropriated to the purchase of books, apparatus, or to some other object for the benefit of the Lyceum, or the interests of education.

Art. 6.—The Officers of this Branch of the Lyceum shall be a President, Vice-President, Treasurer, Recording and Corresponding Secretaries, three or five Curators, and three Delegates, to be appointed by ballot, annually, on the first Wednesday of September.

Art. 7.—The President, Vice-President, Treasurer, and Recording Secretary, will perform the duties usually implied in those offices. The Corresponding Secretary will correspond with other Associations, or with individuals, as circumstances shall require. The Curators will have charge of the Library, Apparatus, Cabinet, and all other property of the Lyceum not appertaining to the Treasury. They will also be the general Agents of the Association, to purchase books, apparatus, etc. and to draw monies from the Treasury for the same, by order of the President, under the direction of the Society. The Delegates will meet Delegates from other Branches of the Lyceum, semi-annually, to adopt Regulations for the general and mutual benefit of their several Associations, and to consult upon measures for carrying into effect any plan for the general diffusion of knowledge, or the improvement of intellectual and practical education.

Art. 8.—The Association will have power to adopt such Bye-Laws and Regulations as are necessary for holding their Meetings, the management and use of the Library, Apparatus, Cabinet, etc., or otherwise for their benefit.

Art. 9.—The foregoing Constitution may be altered or amended, by vote of two-thirds present at any regular meeting, said alteration or amendment having been proposed to the Lyceum, at a meeting not less than four weeks previous to the one at which they are acted upon.

Considerations

Institutions for Mutual Instruction have some advantage over any others which can be formed.

In the first place, they can diffuse information more generally. They may extend it to nearly every member of the community. The old and young, the male and female, the parent and child, the learned and illiterate, the clergyman and physician, the lawyer and statesman, the merchant, mechanic, and farmer, may each benefit others, and, at the same time, confer a double benefit upon himself.

Secondly—the information they communicate is practical. As each Association, from one meeting to another, chooses their subjects of attention, and, as the instruction is communicated principally by discussion and conversation, they will be likely to be of a practical nature, and directly and thoroughly applied to the various avocations and pursuits of those concerned. They also furnish a strong inducement to read, and to apply what they read to their present and future benefit, and thus render a Library a hundred fold more useful.

Thirdly—they have a good moral tendency. This is the most important consideration. Indeed, the morals of the young, in particular, demand, most imperiously, something of this nature; for there are at this moment, in our country, thousands, and many thousands too, the pride and the hope of parents and friends, who are going rapidly to destruction, for the want of some object of sufficient interest to divert their attention from places and practices, calculated to fix upon them habits, which will lead to their ruin with as much certainty as falling bodies are drawn towards the centre of the earth.

It is not frowns, it is not arguments, that will correct or prevent these practices. It is presenting a substitute, which is not less interesting but more useful, that alone will prove an effectual bulwark against vicious habits in the young, and set them in a way that leads to usefulness, respectability and happiness, in this and the future world. Consequently, Associations for mutual improvement in useful knowledge are the best moral societies that can possibly be formed.

Fourthly—they have a good political tendency. The prosperity, and probably the existence, of our Government, depend upon the general diffusion of knowledge. It is upon the ignorant, that the aspiring demagogue acts to effect his designs, and usurp the rights of a nation. The intelligent are better able to see through the pretences and intrigues of a usurper, as well as to understand and support their rights. If all the members of our nation should become enlightened, they would view the principles of their Constitution as inviolable as the mind that planned it, and be ready to defend it with the same boldness and energy as the hand that drew it.

Fifthly—Associations for mutual improvement are economical. If all should unite in them who ought, One Dollar a year each would be sufficient to defray all the current expenses attending them; and, as this dollar is to be appropriated to books and other valuable property, it would be a permanent fund for the future use and benefit of the members and their posterity. In many cases it would be an actual saving of expense; for, as it would turn the attention of the members to subjects of general utility, it would, consequently, divert it from others which are more expensive, and less useful, if not pernicious. The economy of time is not less in their favor: to many it would be a saving of time; to none would it be a loss. And yet, notwithstanding the expense of time or money would in no case be perceptible, and in many there would be an actual saving of both, it is confidently believed that a youth, growing up to manhood, under the advantages and influence of an Association well conducted, would gain more useful, practical information than he would be likely to obtain in a College course.

Sixthly—they may be the means of improving common schools, and establishing in them greater uniformity, both in books and instruction. If these Associations should be formed in most of our towns, and all within a county, or other moderate district, united by a Board of Delegates, the several Boards would have it in their power, not only to adopt regulations for the mutual benefit of their several Branches, but also to take measures for the improvement of common education. There might even be established, under their patronage, institutions for qualifying teachers, and for giving practical instruction on the various subjects fitted to the employments of the farmer and mechanic, if not to those of the legislator, the physician, and the divine.

From the several Boards of Delegates in various parts of the country, a general one might be formed, to be called the American Board of Education. Said American Board would, of course, be composed of gentlemen of the most liberal and enlightened views upon the subject of education; and, if they should meet annually, they would bring together a knowledge of the state and improvements of schools and common education in their several districts, and might recommend measures which would have the most salutary influence upon the interests of the rising generation, and, of course, upon the highest and most lasting interests of our nation and the world.

The foregoing Articles and Considerations are freely submitted to the candor and benevolence of the teacher and parent, the statesman and patriot,

By their Friend,

JOSIAH HOLBROOK

(29——)

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CHAPTER X

Higher Technical Education in Relation to Instruction in the Manual Arts

84. **Higher Technical Schools of France.** The history of technical education is a continuous record of new demands for experts in warfare, transportation, mining, and manufacturing. Often a new demand has been brought about by a new discovery or invention. Sometimes the demand has been for men of extensive theoretical training and some practical experience; at other times it has been for men who have received only a moderate amount of theoretical training and a much larger proportion of practical training and experience. It is customary to speak of the schools planned to educate the former as the higher technical schools, or schools of collegiate grade, and of the latter as the lower technical, or trade schools—schools of secondary grade. Attention has been called already to the fact that during the period now under consideration (up to about 1870) France and Germany had developed many such schools of the lower or secondary type. (cf. Chapter VIII) These countries also were the leaders in establishing schools of the higher or collegiate type. Several of the smaller European countries followed the lead of France and Germany. England, however, developed neither type to any considerable degree until after this period. In America schools of the higher type began to grow up on account of local needs soon after 1820 and the movement toward technical education had gathered great force by 1868.

For a long time France was the recognized leader among the nations in the practice of engineering and in the training of engineers, both military and civil. Italy had held that position at a much earlier period but had lost it to France.

In the year 1747 there was opened in the city of Paris the *École des Ponts et Chaussées.* Its aim was both military and

civil—to train engineers for bridge and road building. (1—562) Another engineering school to be established before the Revolution was the *École des Mines*, also in Paris. In 1795 the famous *École Polytechnique de France* was opened in Paris. It was established by government decree and was intended to supply officers for the several branches of the military and civil service. (1—542) Up to 1836 this school had furnished 2776 young men to positions in the military service, 291 in naval service and 861 to civil departments of the government. In many cases graduates of this school were sent to special schools to get advanced practical training. In 1836 the course of instruction consisted largely of work in pure and applied mathematics, physics and chemistry, architecture, the French and German languages, and drawing. The drawing consisted of topographical, architectural, and freehand drawing, including work in water colors. (1—552)

In 1829, stimulated by the great mechanical and chemical inventions and discoveries of the previous half-century, there was established in Paris the *École Centrale des Arts et Manufactures* for the purpose of training men to become civil engineers and architects, and to take the higher positions in the rapidly developing manufacturing industries. The course of instruction was in many respects similar to that at the *École Polytechnique* but differed materially in one respect; it was not dominated by pure science. On the contrary, it emphasized applied science. It gave much attention to machinery—even to the extent of offering special courses in the steam engine and another in railroads. No attempt, however, was made "to connect practice in the use of mechanical tools with that in general manipulation, even as a special course." (1—570) But in this school the value of illustrative models, of laboratory experiments, and of excursions was recognized. Students in physics constructed models of chimneys and furnaces "with prisms of plaster of one-fourth the size of ordinary bricks." They determined specific gravities, and performed experiments with the thermometer, hydrometer, and barometer. In chemistry, when taking the course in mineral analysis, "special laboratories" were open to pupils, in which they practised in

turn "the processes most useful in their intended callings." In architecture the students visited buildings in the course of erection. In civil engineering practice was given in taking levels. In geography and geology excursions were made in the neighborhood of Paris during the summer. (1—567)

To this school came many students from foreign countries.

85. **Higher Technical Schools in Other European Countries.** At the head of the German system of technical education in the period under consideration were the *Technische Hochschulen.* Generally speaking, these grew out of the lower technical schools and were a part of the German program of national supremacy through efficiency in commerce and industry. To secure this efficiency required trained technologists and experts in many special fields. To train these required a higher type of instruction in both pure and applied science and engineering. Hence, the development of the technical colleges of the same grade as the universities. The oldest school which developed into this type of institution was the *Collegium Carolinum* established in Brunswick in 1745. Then came the Royal Saxon School of Mines (*Königliche Sächsische Bergakademie*) in Freiberg in 1765 and the Royal Architectural Academy in Charlottenburg in 1799. Other schools of this type which followed were established at Clausthal in 1775, Karlsruhe in 1825, Darmstadt in 1826, Munich in 1827, Dresden in 1828, Stuttgart in 1829, Hanover in 1831, and Aachen in 1865. (2—104)

The Bohemian State Technical School (*Technische Böhmische Ständische Lehranstalt*) came into existence in Prague in 1806. In 1815 Vienna opened its Polytechnic Institute. In accordance with the action of the Swiss government in 1848 the Polytechnic Institute of Zurich was opened in 1855.

All these technical colleges and polytechnic schools emphasized instruction in applied science, mathematics, and drawing but they did not give manual instruction to develop skill in the mechanical trades or in trade processes. Such instruction was left to the lower technical and trade schools. Much attention, however, was given to developing industrial museums and laboratory work in science and engineering. In

fact, this period gave to these schools their impulse in the direction of laboratory methods of instruction.

86. **Early American Schools of Applied Science and Engineering.** The same educational urge that gave birth to the early mechanics institutes and the Lyceum Movement in America, and hailed with joy the teachings of Pestalozzi and the various accounts of Fellenberg's institution in Switzerland also planted the germs of America's scientific schools and engineering colleges. Behind the mechanics institute and the lyceum movements was a strong impulse to teach science and mathematics, especially in their applications to agriculture and all sorts of mechanical and manufacturing processes. The most popular subjects for courses of lectures and evening classes were scientific in nature. While the teaching of science was developing, a new type of collegiate institution was in the process of forming—an institution requiring the full time of students and providing a curriculum preparatory to the higher positions in agriculture, the mechanic arts, and engineering.

What is conceded to be the first institution of this type (3—8) (4—II, 361) was the Gardiner Lyceum opened in Gardiner, Maine, in 1823. This institution was called a lyceum; in a degree it was a manual labor school, for in 1830 it had "a large and commodious work shop" with "circular lathes where the ingenious and industrious may earn sufficient to pay their board." (4—II, 231) Like the mechanics institutes it offered short-term courses in highly specialized subjects; yet its most distinctive characteristic was that it was a full-time scientific and technical school "on a liberal scale"—corresponding to college grade. The principal of this new type of American institution was Benjamin Hale (1797–1863) afterward professor of chemistry and mineralogy at Dartmouth College for eight years, and then president of Hobart College for more than twenty years.

The purpose of the Gardiner Lyceum as stated in the inaugural address of the principal was "to give instruction in those branches which are most intimately connected with the arts, and to teach them as the foundation of the arts." Referring to the class of students for which it was intended, he added,

"It is not sufficient for them, as for the general scholar, to be taught the general laws of chemistry; they must be instructed particularly in the chemistry of agriculture and the arts. It is not sufficient for them to be able to repeat and to demonstrate a few of the general laws of mechanics; they must be taught the application of the laws. They must be made acquainted with machines." (3—7)

The original curriculum gave special emphasis to the applications of mathematics and some of the principles of physics and to chemistry. (Source Material X, A) As published in 1827 the course of instruction was as follows:

First year.—Arithmetic, Geography, Bookkeeping, Algebra, Geometry, Mensuration, and Linear Drawing.

Second year.—Trigonometry, Surveying, Navigation, application of Algebra and Geometry, Differential and Integral Calculus, Mechanics, Perspection, Chemistry and Agricultural Chemistry. Instead of the last mentioned study Civil Engineering is pursued by those who prefer it.

Third year.—Natural Philosophy, Astronomy, Political Economy, the Federalist, History, Mineralogy, Natural History, Natural Theology.

Besides the above, Blair's Rhetoric is studied during the first and second years, and the Evidences of Christianity during the second and third years. The students in the two higher classes are also instructed in composition and declamation.

In addition to the three regular classes, extra classes are admitted to pursue particular courses of study, viz.: one in Civil Architecture, admitted in November, and instructed in Geometry, Architectural Drawing, the mechanical principles of Carpentry, etc.; a second in Surveying, admitted in September; a third in Navigation, admitted in September and May; a fourth in Chemistry, admitted in January; and a fifth in Agriculture admitted in November, and instructed in Agricultural Chemistry, Anatomy and diseases of domestic animals, and such parts of Natural History as are peculiarly interesting to the agriculturist. The first and fifth of the above classes continue for about four months, the others, three. (4—II, 216)

Concerning methods of instruction the same source of information gives the following:

It is a constant object in instruction at the Lyceum to familiarise the students' minds with the practical application of their lessons. Surveying and Levelling are taught not only in recitation room but in the field; the pupil in chemistry is carried into the laboratory, and allowed to perform experiments; and the classes in Mechanics are exercised in calculating such problems as occur in the practice of the machinist or engineer. Habits are thus formed of great importance to the pupil; and he becomes familiar with those processes of thought which will be necessary to him in active life. His mind is not

only stored with the abstract principles of science but he has learned the very distinct and no less difficult lesson, of bringing his knowledge to bear upon any subject, to which it is applicable. (4—II, 217)

The funds for the support of the Gardiner Lyceum came partly from gifts, partly from tuition fees, and partly from appropriations made by the state legislature. The institution was so much dependent upon the latter that when, after it had been in operation about ten years, the legislature withdrew its financial support, the Lyceum closed its doors. It had, however, pointed out a definite practical need and shown how to meet it in a practical way. It had taken the initial step in what later became a popular division of American education of college grade.

The second and most important school of this type was the Rensselaer School at Troy, New York, which grew into the Rensselaer Polytechnic Institute of the present day. This school, also, grew out of the needs of a new and developing country and its plan and curriculum did not follow the traditional college course. It was established to give instruction "in the application of science to the common purposes of life." It aimed especially to benefit "the sons and daughters of farmers and mechanics" "in the application of experimental chemistry, philosophy, and natural history, to agriculture, domestic economy, the arts, and manufactures." (3—9) The school was founded in 1824 by Stephen Van Rensselaer who specified many details concerning its management.

Van Rensselaer was the owner of a tract of land now constituting three counties in eastern New York. He was educated in the customary manner of wealthy young men of his time, graduating at Harvard College in 1782. He took an active part in the military and political affairs of his state, was a member of the commission to determine the route of the Erie Canal, and later was the president of the Canal Commission. He was also made president of a Board of Agriculture which made the first attempt in this country "to collect and arrange geological facts with a direct view to the improvement of agriculture." (3—18) While serving on this Board Van Rensselaer became acquainted with Amos Eaton (1776–1842)

who, with two assistants, made the survey. Eaton was the son of a farmer in Chatham, N. Y., had graduated at Williams College with high standing in scientific studies and had been under the instruction of Professor Silliman of Yale College where he did advanced work in chemistry, geology, and mineralogy. Here, too, he studied botany. He returned to Williamstown where he aroused much interest in the study of the natural sciences, and from there he went to take charge of the New York survey. Van Rensselaer recognized in Eaton the man who could carry out his plans. A little later he employed him at his own expense to make a geological survey extending from Boston to Lake Erie and then to give a series of popular lectures on science to audiences along the line of the Erie Canal, for Van Rensselaer was desirous of helping to raise the standard of education among the farmers. These lectures were so successful that Van Rensselaer decided to establish a school, one of the principal objects of which should be to train qualified teachers of science who might go out and do what Eaton had done. (3—19) It is not surprising, then, that Amos Eaton was designated as senior professor in the new Rensselaer School. To his inspiring leadership and sound scholarship the early success of the Rensselaer School was very largely due.

Van Rensselaer and Eaton did not believe in the Fellenberg plan of combining manual labor with school studies but they did believe thoroughly in the principle of teaching through the application of principles. In the by-laws prepared for the school, Van Rensselaer provided, "that, with the consent of the proprietors, a number of well-cultivated farms and workshops in the vicinity of the school be entered on the records of the school as places of scholastic exercise for students, where the application of the sciences may be most conveniently taught." (3—34)

In fact, he specified that, "In every branch of learning the student begins with its practical application, and is introduced to a knowledge of elementary principles, from time to time, as his progress requires. . . . By this method a strong desire to study an elementary principle is excited by bringing his

labors to a point where he perceives the necessity of it and its application to a useful purpose." (3—45)

In harmony with his principle of teaching through application and as a means of training teachers, it was specified that "during the winter term students be exercised in giving lectures, by turns, on all the branches taught in the summer term, under the direction of the professors or their assistants." (3—35) This became one of the distinctive characteristics of the method pursued at the Rensselaer School and the school furnished teachers of applied science to a large number of schools and colleges.

Another feature of the school was the supervised physical exercise. An effort was made to prevent "vulgarisms" often found among students. Jumping, running, scuffling, and the like, were looked upon as detracting from "the dignity of deportment which becomes a man of science." So, after the regular school work of the day came the exercises or "afternoon amusements." (3—46) For the last nine weeks of a spring term these were as follows:

> Collecting and preserving plants, animals, and minerals, land surveying and levelling; calculating water pressure in locks, aqueducts, mill flumes, dams, raceways, penstocks, and pumps; applying the principles of "mechanical philosophy" to the machinery of steamboats, mills, factories, etc.; application of mathematics to cask and ship gauging and to other cases of practical mensuration; examination of the progress of agricultural and horticultural operations; application of active substances to plants in the experimental garden, such as the strong acids and alkalies, the various gases, free and combined, and the effects of the atmospheric gases where all other active agents are excluded. (3—50)

Concerning the students, it is significant that the progressive character of the work done at Rensselaer and the high standing of its professors drew to it many college graduates. "At times nearly half of those enrolled were college graduates." (5—24) Because of this fact and the stimulus it gave to research in those early days, Rensselaer has been regarded as the first graduate school in America. (5—24)

Enough has been said to indicate how scholarship and practical needs combined to call into being the earliest scientific schools in America. The two already mentioned were the fore-

runners of the Scientific Course opened at Union College in 1845, the Sheffield Scientific School established in connection with Yale College in 1847; the Lawrence Scientific School at Harvard College in 1847; and the Chandler Scientific School at Dartmouth College in 1852.

In less than ten years after its founding, the Rensselaer School began to change in character and to take on the professional character for which it has been famous for nearly a century; it gradually became America's first college of engineering.

In Colonial times and during the early years of the nation the engineers who built canals and bridges came from France or were educated there. France was then the world center for engineering education. (cf. 84) As the demand for engineers in the United States was growing when the first science schools were evolved, and as the methods and curriculum at the Rensselaer School seemed to invite development in that direction, it seems very reasonable that in 1835 a department of "Mathematical Arts" was established "for the purpose of giving instruction in Engineering and Technology." In that year the first class of four men was graduated in civil engineering. (3—82)

87. **The Land-Grant Act of 1862.** In tracing out the early efforts to promote agricultural education, it becomes evident that there were two important centers of effort: the agricultural societies and the college professors offering courses in the natural sciences. And when the agricultural societies acted most effectively they were led by educated men who had caught the vision of an improved agriculture while in the college classroom or laboratory or in their labors on the farm. Improvement in agriculture came through combining the knowledge of the practical tiller of the soil with that of the professor of science.

The first agricultural society on the American continent was the Philadelphia Society for Promoting Agriculture organized in 1785. This was followed by the New York Society for the Promotion of Agriculture in 1791 and the Massachusetts Society for Promoting Agriculture in 1792. Then came more

state societies and many county societies. The Pennsylvania Horticultural Society formed in 1827 and the Massachusetts Horticultural Society in 1829 were the leaders in their particular field. (6—5)

The two great obstacles to the development of agricultural education were, in the first place, the opinion too common among farmers that the college-bred men who were promoting agricultural education were merely "book-farmers" and in the second place, prejudice and ignorance on the part of the literary college men who still looked down upon instruction in applied science as inferior to work in langauge and literature.

An illustration of the kind of conflicts that took place is found in the efforts and defeat of the progressive men of Massachusetts who sought to establish a college of agriculture in 1849. The Norfolk Agricultural Society had espoused the cause of agricultural education and proposed immediate action both by the state and the nation. On the occasion of the first exhibition of this Society a notable group of men were brought together to make addresses on the subject. Among these were Daniel Webster, Edward Everett, Horace Mann, Josiah Quincy, then president of Harvard College, Charles Francis Adams, Robert C. Winthrop, Levi Lincoln, the governors of Massachusetts and New Hampshire, and others. As a result of this meeting a bill was prepared for the Massachusetts legislature of 1850, providing for a college of agriculture. It passed the upper house without a dissenting vote but was rejected by the lower house because of the opposition of the farmers to "book-farming." The promotors did, however, succeed in securing the appointment of a commission, of which Marshall P. Wilder (1798–1886) was the head, to report on the expediency of establishing agricultural schools and colleges. In 1851 the commission made a comprehensive report including an account of some 350 agricultural schools and colleges in European countries. Still no favorable action was possible by the legislature and the friends of agricultural education "came to the conclusion that the term, a *school* of agriculture, was more consonant to the times than an institution of larger calibre." (6—17)

Meanwhile interest in agricultural education was growing in many states, and an especially strong sentiment was developing in Illinois. In 1850, Jonathan Baldwin Turner (1805–1899), president of the Illinois State Teacher's Institute, at the annual session held that year in the month of May at Griggsville, Pike County, made an address in which he presented his idea of a state industrial university which should educate for all agricultural and industrial occupations in the state.

Turner was a native of Worcester County, Massachusetts, a graduate of Yale College, and had been a professor at Illinois College at Jacksonville from 1833 to 1848, but his religious views were too liberal for the Presbyterian control of the college and his anti-slavery sentiment was too strong for a college community that was largely pro-slavery. He therefore turned to horticulture as an occupation, but continued to identify himself with the educators of the state and to give freely of his energy and ability to the promotion of popular education.

The Griggsville address "gave the first impetus to the movement that established the great state land-grant universities of this country." (7—75) In this notable address Turner stated that the educational needs of the industrial classes of society are different from those of the professional class. He argued for an industrial university to train "thinking laborers" and outlined in remarkable detail what should be taught in such a university and the spirit in which such an institution should be managed. (Source Material X, B)

The next year, 1851, in the month of November, Professor Turner was the leading speaker at a convention of farmers from several counties which was held at Granville, in Putnam County. The purpose of the convention was to adopt measures which might lead to the establishment of "an agricultural school, or agricultural department in some school in northern Illinois." (7—96) On this occasion Professor Turner expanded the views of his hearers by unfolding to them his plan for the establishment and maintenance of a state university to include not only the agricultural but also the industrial classes of society. The following resolutions, prepared by a committee

of which Professor Turner was chairman, were adopted by the convention:

Resolved, That we greatly rejoice in the degree of perfection to which our various institutions, for the education of our brethren engaged in professional, scientific, and literary pursuits, have already attained, and in the mental and moral elevation which those institutions have given them, and their consequent preparation and capacity for the great duties in the spheres of life in which they are engaged; and that we will aid in all ways consistent for the still greater perfection of such institutions.

Resolved, That as the representatives of the industrial classes, including all cultivators of the soil, artisans, mechanics, and merchants, we desire the same privileges and advantages for ourselves, our fellows, and our posterity, in each of our several pursuits and callings, as our professional brethren enjoy in theirs; and we admit that it is our own fault that we do not also enjoy them.

Resolved, That, in our opinion, the institutions originally and primarily designed to meet the wants of the professional classes, as such, cannot, in the nature of things, meet ours, any more than the institutions we desire to establish for ourselves could meet theirs. Therefore,

Resolved, That we take immediate measures for the establishment of a university in the State of Illinois expressly to meet those felt wants of each and all the industrial classes of our State; that we recommend the foundation of high schools, lyceums, institutes, etc., in each of our counties, on similar principles, so soon as they may find it practicable so to do.

Resolved, That, in our opinion, such institutions can never impede, but must greatly promote, the best interests of all those existing institutions. (7—98)

Provision was made for giving publicity to Professor Turner's plan and a committee representing ten counties was appointed to call a state convention. This was held at Springfield in June 1852. On this occasion the representatives of the "classical and theological colleges" attempted to break up the meeting by ridicule, but were cleverly beaten at their own game by Professor Turner, and they departed "amid the laughter and jeers of their intended victims." (7—106) They were opposed to the plan for an industrial university because they wanted to secure state funds for their own institutions.

This convention resulted in a memorial to the state legislature prepared by Professor Turner, in one paragraph of which he suggested that an appeal for support be made to Congress. This paragraph, which seems to have been the first formulation of the plan that subsequently brought into being the land-grant colleges, was as follows:

We desire that some beginning should be made, as soon as our statesmen may deem prudent so to do, to realize the high and noble ends for the people of the State proposed in each and all of the documents above alluded to. And if possible on a sufficiently extensive scale to honorably justify a successful appeal to Congress, in conjunction with eminent citizens and statesmen in other States, who have expressed their readiness to cooperate with us, for an appropriation of public lands for each State in the Union for the appropriate endowment of universities for the liberal education of the industrial classes in their several pursuits in each State in the Union. (7—108) (8—22)

The memorial was received with favor. Richard Yates (1818–1873), a personal friend and former pupil of Professor Turner, then a member of Congress and later the "war governor" of Illinois, presented the Granville address to the National Agricultural Convention held in Washington, and it was referred to a committee. (7—110) This was in 1852. Then came several years of effective promotion work by the Industrial League of Illinois, formed for the purpose, and of which Professor Turner was the director. (8—110) The cause was espoused by farmers' organizations, agricultural journals, some leading educators, and many newspapers throughout the nation. (8—96–107)

In March 1854, resolutions which had been passed by the Illinois legislature recommending Professor Turner's land-grant scheme for establishing state universities was presented to Congress. In April Mr. Yates asked Professor Turner to prepare a bill for presentation to Congress. Then came another delay. Mr. Yates was not returned to Congress, and opposition to land-grants was growing. Turner appealed to Senator Trumbull of Illinois who advised that owing to the feeling in the East about land-grants, "some of the older states" "take hold of the matter." The newer states had already received "such large grants for schools and other purposes" that the measure would receive less favor if it came from one of them. (7—158)

In December, 1855, Justin S. Morrill (1810–1898) of Vermont became a member of the House of Representatives. He was at once recognized as an able man of fine personality and a friend of agriculture. Senator Trumbull sent him all the documents, papers and pamphlets concerning the land-grant

for universities and asked him to introduce the bill. "This, at first, he was reluctant to do, but finally consented" and when he presented it in December 1857 he did it with the force and enthusiasm which immediately brought to his support friends of popular education in the Eastern states. The measure now had a real champion in Washington. It passed the House but failed in the Senate. In 1859, it was again introduced, and passed both houses, but was vetoed by President Buchanan. (7—159)

In the campaign of 1860 both Abraham Lincoln and Stephen A. Douglas promised Professor Turner that they would sign the bill if elected. When Congress met Mr. Morrill again introduced the bill; it passed both houses of Congress and was signed by President Lincoln on July 2, 1862.

Thus the vision and unremitting efforts of Jonathan B. Turner and the statesmanship and skill of Justin S. Morrill under the approving seal of Abraham Lincoln gave to the American Nation its most important piece of educational legislation, and one of the most comprehensive and far-reaching "schemes for the endowment of higher education ever adopted by any civilized nation." (8—13) By the terms of the Land-Grant Act, 30,000 acres of public land per senator and representative in Congress were granted to provide colleges of agriculture and the mechanic arts in the several states. Out of this Act and the later amendments and additions to it have grown most of the present state colleges of agriculture and mechanic arts, and many of the state universities. A few agricultural colleges, however, were established before the act was passed; for example, Michigan in 1857 and Pennsylvania in 1859. Considerable delay in establishing institutions under the Act was caused by the Civil War, though Kansas took action in 1863 and Vermont in 1865. Others that followed soon after the War were Massachusetts, New York, Illinois, Iowa, Wisconsin, Oregon, California, Maine, and Missouri. In this connection it is significant that in Illinois the land-grant institution was given the name "Illinois Industrial University," but later it was changed to "University of Illinois."

88. **The Workshop in the School of Engineering.** As stated in a previous section (cf. 86) the first class in civil engineering

to graduate in America left the Rensselaer School in 1835. Military engineering, however, including the same principles and some of the same applications as civil engineering, had been taught at the United States Military Academy at West Point, New York, since its reorganization just after the War of 1812. The development of civil engineering into the many special branches of engineering of today was a relatively slow process. Not until after the Civil War did mechanical engineering become an important course in engineering schools. According to a table of statistics on polytechnic and scientific schools prepared by Professor S. Edward Warren of Rensselaer Polytechnic Institute there were, in 1866, only three American schools offering courses leading to a degree in mechanical engineering. These were the Rensselaer Polytechnic Institute, the Polytechnic College of Pennsylvania, and the Massachusetts Institute of Technology which had been opened the previous year. Just as the civil engineering course had come into being to meet the demand for engineers to survey land, to build docks and bridges, canals and railroads, so the mechanical engineering course grew out of the invention of machinery and the development of manufacturing.

In Colonial times the Mother Country did not favor manufacturing in the colonies. In 1750 the English Parliament passed a law prohibiting the "erection or continuance of any mill or other engine for slitting or rolling iron, or any plating forge to work with a tilt hammer, or any furnace for making steel in the colonies under penalty of two hundred pounds." (9—IX, 335) England wanted to do all the manufacturing for the colonies, and even after the Revolution, some of the leading American statesmen saw little opportunity for the United States to become a manufacturing nation. But the application of the steam engine to water transportation by Robert Fulton (1765–1815), to flour milling by Oliver Evans (1755–1819); the invention of the cotton-gin by Eli Whitney (1765–1825), the sewing machine by Elias Howe (1819–1867), which was patented in 1845; the improvements in steam engines made by George H. Corliss (1817–1888) and patented in 1849; and scores of other mechanical inventions and machine improve-

ments brought about an era of industrial enterprise which was of prime importance to the development of the nation and called for special training for those who were to take the responsible positions in the mechanical industries. (9—IX, 339) Moreover, it demanded a type of training that was essentially new because it must combine theory and practice—scientific reasoning and shop experience.

The first American school to combine these two elements in the mechanical engineering field was the Worcester County Free Institute of Industrial Science, later called the Worcester Technical Institute, and since 1887 known as the Worcester Polytechnic Institute at Worcester, Massachusetts. In the year 1865 John Boynton of Templeton, in Worcester County, placed in the hands of his former partner, David Whitcomb of Worcester, the sum of $100,000 for the endowment of a free school, which was to be located in Worcester if the citizens of Worcester should provide the land and suitable buildings. This condition was complied with by a gift of the land and of $61,111 contributed by 232 individuals and twenty shops and factories. (9—IX, 339)

Later in the same year Ichabod Washburn, a Worcester manufacturer, offered to establish a machine shop as one of the departments of the Institute. He gave for this purpose $25,000 and later $50,000. For several years Mr. Washburn had been considering the founding of a school in connection with the Mechanics Association but he decided to add his gift to those of Mr. Boynton and the other citizens of Worcester. (9—IX, 341)

Mr. Boynton, in his letter of gift, outlined for the Institute a comprehensive curriculum covering the instruction of the scientific schools of that time and added a few subjects not ordinarily included in such schools. Mr. Washburn's letter of gift dated in March 1866 proposed to establish what would now be understood to be a trade school with instruction in the principles of science added. Thus it came about that a new type of mechanical engineering course was made possible—a course which combined experience in a shop "run upon a commercial scale and producing articles to be sold in the market" and a theoretical course in applied science and engineering. (9—IX,

342) The important difference between this shopwork and that of most of the earlier manual labor schools was that in this school shopwork was done in order to learn how to do it in the best way, and no pay was received for the work, while in the earlier shops the work was done for the benefit gained through the supposed physical exercise involved in it or in order to earn a part or all of one's living expenses. In the manual labor schools little or no value was placed on instruction in the mechanic arts or learning the processes of industry; in the Worcester school, from its beginning, the shopwork had a definite educative purpose behind it. It was intended to be just as educational as laboratory work in science. It was a substitute for apprenticeship to be taken while pursuing a well organized course in mathematics, science, and engineering.

As stated by Charles O. Thompson, first president of the Worcester County Free Institute of Industrial Science, the fundamental ideas behind that school at its opening in 1868 were these:

1. That all mechanical engineers will find their account, in future, in going through a work-shop training.

2. This work-shop instruction may precede, accompany or follow the intellectual training, but for many reasons it preferably accompanies it.

3. The work-shop instruction is best given in a genuine manufacturing machine shop where work is done that is to be sold in open market and in unprotected competition with the products of other shops.

4. That in a course of three and a half years, working 800 hours the first half year and 500 hours a year thereafter, a boy beginning without any knowledge of mechanics can acquire skill enough to offer himself at graduation as a journeyman and will be found on trial not inferior to those who have spent the entire time of three and a half years in a regular machine shop.

5. That the work-shop practice must be a part of every week's work in the institution; that it shall be momentarily supervised by skilful men, and that the student must not expect or receive any pecuniary advantage from it.

6. That the question who shall be a superintendent or foreman or engineer engaged in designing or draughting machinery cannot be settled in any school—that being a question to be determined only by actual trial; because the discipline of the judgment by actual practice into which personal responsibility enters is vitally essential to a valid claim to the post of superintendent. Hence, it will follow that, while all receive the preliminary training requisite for engineering, many will not attain to it, but these will find a full reward for all their time and labor in superior intelligence as workmen—in being masters and not servants of the machines which they make or run. (10—IV, 726, 727)

At the time the first class was graduated a seventh fundamental idea was announced. It was:

7. That the value of the education they have received will show itself in the rate of their advancement and will be easily detected by their employers, and that they should not be so much concerned, in seeking places, about great wages or high positions as about the chances ahead for advancement; indeed there might be cases in which they could well afford to work a while for a bare subsistence, such would be the value of their experience. (10—IV, 727)

After fourteen years of experience, President Thompson spoke of these seven as tested principles and declared that they were valid. During that time other schools had begun to adopt them. (10—IV, 727)

The success of the "Washburn Shops" of the Worcester school, which included a shop for general woodworking and pattern making, a small blacksmith shop, and a small drafting room as well as a large machine shop—in fact, a complete manufacturing unit—was due not only to the educational principles adopted but also to the inspiring personality and rare business ability of the superintendent of these shops, Milton P. Higgins (1842–1912), into whose hands Mr. Washburn placed the responsibility of developing his ideal. It is significant that Mr. Higgins developed his taste for mechanical work early in life in his father's blacksmith and repair shop, that he was apprenticed to learn the machinist's trade in a large manufacturing establishment, and then that he graduated at Dartmouth College just before entering upon his work at the Worcester school. In all the twenty-seven years at the Washburn Shops and his later years of service to industrial education he adhered to the belief that a workman, whether ultimately to become a machinist or an engineer, should be trained in a production shop—a real manufacturing shop.

SOURCE MATERIAL X, A

The Gardiner Lyceum

From a Review of Announcements of the School which appeared in the *United States Literary Gazette*, published in Boston in 1825

As this is the first institution, on a liberal scale, which has been established in New England expressly for the benefit of farmers and mechanics, we suppose that some account of its plan, progress, and situation, cannot fail to be interesting to our readers. This account will be principally taken from the Addresses to the Public of the Trustees and Principal of the Lyceum, which have been published at various times since its incorporation in 1822.

It had its origin in the wants of the community,—wants similar to those which have led to the establishment of lectures for mechanics in many parts of Great Britain and in some of the cities of the United States,—and in the desire of useful, practical knowledge, which is more and more felt through all parts of the country, in proportion as it becomes more free. The greater part of our mechanics and farmers have little or no knowledge of the scientific principles of their arts. The eminent practical sagacity for which they are distinguished must often be exhausted in the discovery of methods, which would be deduced with perfect ease from simple principles in geometry and natural philosophy. But these sciences, together with chemistry and other analogous branches of knowledge, have been rarely taught, except at college, and as a part of a course of studies for persons intended for the learned professions. The academies and high schools are almost universally preparatory and subordinate to the colleges. The instructors in them are selected with reference to this subject; their attention is chiefly devoted to it; and even when they have the capacity and inclination to give instruction in the sciences, they are prevented by want of apparatus and of time. In the secondary schools, little else is taught but reading, writing, grammar, arithmetic and geography. The Gardiner Lyceum was intended to supply this deficiency, for a portion of our country, and to furnish that kind of instruction which is not furnished elsewhere, and which is most necessary to many important classes in the community. Algebra, geometry, trigonometry, mensuration, bookkeeping, surveying, navigation, mechanics, hydrostatics, pneumatics, and chemistry, together with the branches usually taught at schools, constitute the original course which was designed to occupy the space of two years. During the third year the learner was to proceed to other branches of natural philosophy and mathematics, and to natural history and the philosophy of the mind. These, with exercises in composition, instruction in natural and revealed religion, and lectures on several of the above branches, completed the original plan.

The Lyceum was opened in January, 1823, under the direction of Mr. Benjamin Hale, as Principal. It began with only two or three students, but the number gradually increased until August, when a second class was admitted. In November there were twenty students, ten in each class. At this time a second Address of the Trustees was published, containing a more particular

account of the studies to be pursued in the different years, than had before been given,—an outline of the lectures on chemistry and mechanics, and an intimation of the desire of the Trustees to have a farm and a professor of agriculture and the kindred arts, connected with the institution. The Address gives the following as "the principal objects, which the Trustees have in view, in establishing the professorship in connection with a practical farm."

1. To give to the future agriculturist the knowledge of those principles of science upon which his future success depends, and to let him see them reduced to practice.
2. To furnish a beneficial employment, as recreation.
3. To diminish the expenses of board.
4. To try a series of agricultural experiments adapted to the soil and climate of Maine.

The trustees also express a hope, that they shall be able to provide some suitable employment for those young men who may attend the institution with a view to becoming mechanics, by which they may be enabled to discharge their expenses. Another object of the Trustees is to collect the best models of useful tools and machines.

The academical year begins in August; and the catalogue published in October, 1824, states the whole number of students at the Lyceum, at that time, to be sixty-six,—a very large number for a school upon an entirely new plan, and drawn together within less than two years from its commencement. The address to the public, by the principal instructor, accompanying the catalogue of October, 1824, gives an account of the adoption of three new and important measures.

I. For the benefit of those, who cannot attend throughout the year, winter classes are proposed for instruction in (1) Surveying, (2) Navigation, (3) Carpentry and Civil Architecture, (4) Chemistry.

II. A boarding-house is established, at which the expenses of board, washing, and room are reduced to $1.50 a week, making only 65 dollars a year.

III. A new method of discipline and government is adopted, formed upon the model of the celebrated Hofwyl school, the constitution of which we have already laid before our readers at length. Some modifications have been made in that system of government, but we shall take no further notice of them at this time; as a full account both of the method and its success will appear at some future period in this Gazette.

Arrangements are made to devise suitable courses of studies for mariners and merchants, as well as for those classes for which the institution seems to have been at first principally designed.

Two additional instructors are already employed,—a tutor in mathematics and an instructor in natural history.

The works used as text-books are, perhaps, as good as could be selected out of the miserable mass from which a selection must be made. Many of them, however, are too general and abstract for pupils, whose minds are so unaccustomed to study and close application, as the minds of those must be who form the generality of the school. Many of them are too voluminous for text-books, and some are radically and essentially wrong in principle. We mean in the principle of communicating knowledge. Unless, therefore, these inherent difficulties are overcome by more patience and devotedness in mak-

ing oral and familiar explanations, than generally falls to the lot of teachers, the school must fail of accomplishing the utmost of which it is capable, until the experience of the instructors shall suggest plans for books more consonant with the principles and phenomena of the human mind, and of course better suited to the objects of this promising establishment. . . .

The Monday morning recitations are in Scripture History, Paley's Natural Theology, and Paley's Evidences of Christianity. It is impossible to speak too highly of an arrangement, which gives so conspicuous a place to a kind of knowledge essential to our social and political happiness. There seems to be one defect in the course of study, which indeed is common to almost every school in New England. No effectual provision is made for instruction in *drawing;* by which nothing more is here meant, than what is technically called right-line drawing. Without some knowledge of this, it is impossible that a correct draught or plan should be made of a bridge, a dam, or a house; of a machine, a ship, a harbour, coast, or piece of land. It ought therefore to be one of the first objects of attention to the architect, the navigator, and the surveyor; all of whom are to be provided for in such a school as this. In most countries of Europe it is one of the first pursuits in the common schools, and it is so useful to all persons engaged in the manual arts, and would be so pleasing an acquisition to the scholar, that it strongly recommends itself to general notice. Some mention is made of it in a sketch of the studies for one of the winter classes, but it seems not to be thought of sufficient importance to be made a distinct study. . . . In so favourable a situation, and under the management of persons so skillful and active as the instructor and directors have already shown themselves to be, it is very desirable that the experiment of a practical farm, superintended by a professor of agriculture, and carried on in a great degree by the students themselves, should be fairly tried. It is difficult to doubt of its utility as an instrument of instruction and agreeable recreation; but, whatever it may bring to the Lyceum, it can produce only good to the people. It is one of those great philosophical experiments, which the voice of the agricultural community has long called for, and the directors of the Lyceum at Gardiner are fortunate and wise in being the first to hear and understand the call. Philosophy has of late years enriched the arts of life with too many and too valuable gifts to leave it doubtful that a close union between enlightened theory and patient labour, on a great scale, will be productive of the most beneficial results.

It is with similar feelings and hopes that the plan must be contemplated of building workshops, furnished with various instruments, for the recreation and exercise of those students, who may be destined to any of the mechanical arts.

There are several particulars relating to the Lyceum, which have been merely mentioned, though they are of a very interesting nature. Such are the new mode of government, the institution of winter classes, the places and modes of study and recitation. Of these and many other points, experiments are making, in the true spirit, it strikes us, of philosophical induction, and they can lead only to the happiest results. We cannot conclude this brief notice of the plan and purposes of the Gardiner Lyceum, without expressing our admiration of the spirit with which the institution was projected, and with which its best interests have been guarded and fostered. From the

different addresses of the trustees and the principal, as well as from personal observation, we are deeply interested, and shall watch the progress of the school with raised expectations. The instructors are zealously engaged in their profession, and neither bigotedly attached to old forms on the one hand, nor possessed of such a violent rage for improvement on the other, as will lead them much beyond the clear light of their own experience. That portion of our countrymen must be regarded as fortunate, who have in their neighborhood an establishment so well adapted to their wants. We believe, and we cannot withhold the expression of our belief, that, although this school has less "pomp and circumstance"—the splendid quackery of education—than many others, yet it will prove, in the end, to be more substantially useful than any institution for similar purposes within our knowledge. (4—II, 361–367)

SOURCE MATERIAL X, B

A State University for the Industrial Classes

By Jonathan Baldwin Turner

Selections from his Griggsville Address, May 13, 1850. (The same address, with but slight verbal changes, was presented at Granville, November 18, 1851. In 1853 it was published in a pamphlet issued by the Industrial League of Illinois.)

All civilized society is, necessarily, divided into two distinct co-operative, not antagonistic, classes: a small class, whose proper business it is to teach the true principles of religion, law, medicine, science, art, and literature; and a much larger class, who are engaged in some form of labor in agriculture, commerce, and the arts. For the sake of convenience, we will designate the former the *professional*, and the latter the *industrial* class; not implying that each may not be equally industrious, the one in their intellectual, the other in their industrial pursuits. Probably in no case would society ever need more than five men out of one hundred in the professional class, leaving ninety-five in every hundred in the industrial; and, so long as so many of our ordinary teachers and public men are taken from the industrial class, as there are at present, and probably will be for generations to come, we do not really need over one professional man for every hundred, leaving ninety-nine in the industrial class.

The vast difference, in the practical means, of an *appropriate liberal education*, suited to their wants and their destiny, which these two classes enjoy, and ever have enjoyed the world over, must have arrested the attention of every thinking man. True, the same general abstract science exists in the world for both classes alike; but the means of bringing this abstract truth into effectual contact with the daily business and pursuits of the one class does exist, while in the other case it does not exist, and never can till it is new created.

The one class have schools, seminaries, colleges, universities, apparatus, professors, and multitudinous appliances for educating and training them, for months and years, for the peculiar profession which is to be the business of their life; and they have already created, each class for its own use, a vast and voluminous literature that would well-nigh sink a whole navy of ships.

But where are the universities, the apparatus, the professors, and the literature specifically adapted to any one of the industrial classes? Echo answers, Where? In other words, society has become, long since, wise enough to know that its *teachers* need to be educated; but it has not yet become wise enough to know that its *workers* need education just as much. In these remarks I have not forgotten that our common schools are equally adapted and applied to all classes; but reading, writing, etc., are, properly, no more education than gathering seed is agriculture, or cutting ship-timber navigation. They are the mere rudiments, as they are called, or means—the mere instrument of an after education; and, if not so used, they are and can be of little more use to the possessor than an ax in the garret or a ship rotting upon the stocks.

Nor am I unmindful of the efforts of the monarchs and aristocrats of the Old World in founding schools for the "fifteenth cousins" of their order, in hopes of training them into a sort of *genteel farmers*, or rather *overseers* of farmers; nor yet of the several "back fires" (as the *Prairie Farmer* significantly designates them) set by some of our older professional institutions to keep the rising and glazing thought of the industrial masses from burning too furiously. They have hauled a canoe alongside of their huge professional steamships and invited all the farmers and mechanics of the State to jump on board and sail with them; but the difficulty is, they will not embark. We thank them for even this courtesy. It shows that their hearts are yearning toward us, notwithstanding the ludicrous awkwardness of their first endeavors to save us.

An answer to two simple questions will perhaps sufficiently indicate our ideas of the whole subject, though that answer on the present occasion must necessarily be confined to a bare outline. The first question, then, is this:

1. What Do the Industrial Classes Want?
2. How Can That Want Be Supplied?

The first question may be answered in few words. They want, and they ought to have, the same facilities for understanding the true philosophy, the science and the art of their several pursuits (their life business), and of efficiently applying existing knowledge thereto, and widening its domain, which the professional classes have long enjoyed in their pursuits. Their first labor is, therefore, to supply a vacuum from fountains already full, and bring the living waters of knowledge within their own reach. Their second is, to help fill the fountains with still greater supplies. They desire to depress no institution, no class whatever; they only wish to elevate themselves and their pursuits to a position in society to which all men acknowledge they are justly entitled, and to which they also desire to see them aspire.

2. How, Then, Can That Want Be Supplied?

In answering this question, I shall endeavor to present, with all possible frankness and clearness, the outline of impressions and convictions that have been gradually deepening in my own mind, for the past twenty years, and let them pass for whatever the true friends of the cause may think them worth.

And I answer, first, negatively, that this want cannot be supplied by any of the existing institutions for the professional classes, nor by an incidental appendage attached to them as a mere secondary department.

These institutions were designed and adapted to meet the wants of the professional classes, as such—especially the clerical order; and they are no more

suited to the real wants of the industrial class than the institution we propose for them would be suited to the professional class.

Their whole spirit and aim is, or should be, literary and intellectual—not practical and industrial; to make men of books and ready speech—not men of work, and industrial, silent thought. But the very best classical scholars are often the very worst practical reasoners; and that they should be made workers is contrary to the nature of things, the fixed laws of God. The whole interest, business, and destiny for life of the two classes run in opposite lines; and that the same course of study should be equally well adapted to both is as utterly impossible as that the same pursuits and habits should equally concern and benefit both classes.

The industrial classes know and feel this, and therefore they do not, and will not, patronize these institutions, only so far forth as they desire to make professional men for public use. As a general fact, their own multitudes do, and *will forever*, stand aloof from them; and, while they desire to foster and cherish them for their own appropriate uses, they know that they do not, and can not, fill the sphere of their own urgent industrial wants. They need a similar system of *liberal education* for their own class, and adapted to their own pursuits; to create for them an *industrial literature*, adapted to their professional wants; to raise up for them *teachers* and *lecturers* for subordinate institutes; and to elevate them,their pursuits, and their posterity to that relative position in human society for which God designed them.

The whole history of education, both in Protestant and Catholic countries, shows that we must begin with the higher institutions, or we can never succeed with the lower; for the plain reason that neither knowledge nor water will run uphill. No people ever had, or ever can have, any system of common schools and lower seminaries worth anything until they have first founded their higher institutions and fountains of knowledge from which they could draw supplies of teachers, etc., for the lower. We would begin, therefore, where all experience and common sense show that we must begin, if we would effect anything worthy of an effort.

In this view of the case, the first thing wanted in this process is a National Institute of Science, to operate as the great central luminary of the national mind, from which all minor institutions should derive light and heat, and toward which they should also reflect back their own. This primary want is already, I trust, supplied by the Smithsonian Institute, endowed by James Smithson, and incorporated by the United States Congress at Washington, D. C.

To cooperate with this noble institute, and enable the industrial classes to realize its benefits in practical life, we need a University for the Industrial Classes in each of the States, with their consequent subordinate institutes, lyceums, and high schools in each of the counties and towns.

The objects of these institutes should be to apply existing knowledge directly and efficiently to all practical pursuits and professions in life, and to extend the boundaries of our present knowledge in all possible practical directions.

Plan for the State University.—There should be connected with such an institution, in this State, a sufficient quantity of land, of variable soil and aspect, for all its needful annual experiments and processes in the great interests of agriculture and horticulture.

Buildings of appropriate size and construction for all its ordinary and special uses; a complete philosophical, chemical, anatomical, and industrial apparatus; a general cabinet, embracing everything that relates to, illustrates, or facilitates any one of the industrial arts, especially all sorts of animals, birds, reptiles, insects, trees, shrubs, and plants found in this State and adjacent States.

Instruction should be constantly given in the anatomy and physiology, the nature, instincts, and habits of all animals, insects, trees, and plants; their laws of propagation, primogeniture, growth, and decay, disease and health, life and death; on the nature, composition, adaptation, and regeneration of soils; on the nature, strength, durability, preservation, perfection, composition, cost, use, and manufacture of all materials of art and trade; on political, financial, domestic, and manual economy (or the saving of labor of the hand) to all industrial processes; on the true principles of national, constitutional, and civil law, and the true theory and art of governing and controlling or directing the labor of men in the State, the family, shop, and farm; on the laws of vicinage, or the laws of courtesy and comity between neighbors, as such, and on the principles of health and disease in the human subject, so far at least as is needful for household safety; on the laws of trade and commerce, ethical, conventional, and practical; on bookkeeping and accounts; and, in short, in all those studies and sciences, of whatever sort, which tend to throw light upon any art or employment which any student may desire to master, or upon any duty he may be called to perform, or which may tend to secure his moral, civil, social, and industrial perfection as a man.

No species of knowledge should be excluded, practical or theoretical; unless, indeed, those specimens of "organized ignorance" found in the creeds of party politicians and sectarian ecclesiastics should be mistaken by some for a species of knowledge.

Whether a distinct classical department should be added, or not, would depend on expediency. It might be deemed best to leave that department to existing colleges as their more appropriate work, and to form some practical and economical connection with them for that purpose; or it might be best to attach a classical department in due time to the institution itself.

To facilitate the increase and practical application and diffusion of knowledge, the professors should conduct, each in his own department, a continued series of *annual experiments*.

For example, let twenty or more acres of each variety of grain (each acre accurately measured) be annually sown, with some practical variation on each acre, as regards the quality and preparation of the soil, the kind and quantity of seed, the time and mode of sowing or planting, the time and modes and processes of cultivation and harvesting, and an accurate account kept of all costs, labor, etc., and of the final results. Let analogous experiments be tried on all the varied products of the farm, the fruit-yard, the nursery, and the garden; on all modes of crossing, rearing, and fattening domestic animals, under various degrees of warmth and light, with and without shelter; on green, dry, raw, ground, and cooked food, cold and warm; on the nature, causes, and cure of their various diseases, both of those on the premises and of those brought in from abroad; and advice given, and annual reports made on those and all similar topics. Let the professors of physiology and ento-

mology be ever abroad at the proper seasons, with the needful apparatus for seeing all things visible and invisible, and scrutinizing the latent causes of all those blights, blasts, rots, rusts, and mildews which so often destroy the choicest products of industry, and thereby impair the health, wealth and comfort of millions of our fellow men. Let the professor of chemistry carefully analyze the various soils and products of the State, retain specimens, give instruction, and report on their various qualities, adaptions, and deficiencies.

Let similar experiments be made in all other interests of agriculture and mechanic or chemical art, mining, merchandise, and transportation by water and by land, and daily practical and experimental instruction given to each student in attendance in his own chosen sphere of research or labor in life. Especially let the comparative merits of all labor-saving tools, instruments, machines, engines, and processes be thoroughly and practically tested and explained, so that their benefits might be at once enjoyed, or the expense of their cost avoided by the unskilful and unwary.

It is believed by many intelligent men that from one third to one half the annual products of this State are annually lost from ignorance on the above topics. And it can scarcely be doubted that in a few years the entire cost of the whole institution would be annually saved to the State in the above interests alone, aside from all its other benefits, intellectual, moral, social, and pecuniary.

The apparatus required for such a work is obvious. There should be grounds devoted to a botanical and common garden, to orchards and fruit-yards, to appropriate lawns and promenades, in which the beautiful art of landscape-gardening could be appropriately applied and illustrated, to all varieties of pasture, meadow, and tillage needful for the successful prosecution of the needful annual experiments. And on these grounds should be collected and exhibited a sample of every variety of domestic animal, and of every tree, plant, and vegetable that can minister to the health, wealth, or taste and comfort of the people of the State; their nature, habits, merits, production, improvement, culture, diseases, and accidents thoroughly scrutinized, tested, and made known to the students and to the people of the state.

There should also be erected a sufficient number of buildings and out-buildings for all the purposes above indicated, and a *repository*, in which all the ordinary tools and implements of the institution should be kept, and models of all other useful implements and machines from time to time collected, and tested as they are proffered to public use. At first it would be for the interest of inventors and vendors to make such deposits. But, should similar institutions be adopted in other States, the general government ought to create in each State a general patent office, attached to the universities, similar to the existing deposits at Washington, thus rendering this department of mechanical art and skill more accessible to the great mass of the people of the Union.

I should have said, also, that a suitable industrial library should be at once procured, did not all the world know such a thing to be impossible, and that one of the first and most important duties of the professors of such institutions will be to begin to create, at this late hour, a proper practical literature and series of text-books for the industrial classes.

As regards the *professors*, they should, of course, not only be men of the

most eminent, practical ability in their several departments, but their connection with the institution should be rendered so fixed and stable as to enable them to carry through such designs as they may form, or all the peculiar benefits of the system would be lost.

Instruction, by lectures and otherwise, should be given mostly in the colder months of the year, leaving the professors to prosecute their investigations, and the students their necessary labor, either at home or on the premises, during the warmer months.

The institution should be open to all classes of students above a fixed age, and for any length of time, whether three months or seven years, and each taught in those particular branches of art which he wishes to pursue, and to any extent, more or less. And all should pay their tuition and board bills, in whole or in part, either in money or necessary work on the premises—regard being had to the ability of each.

Among those who labor, medals and testimonials of merit should be given to those who perform their tasks with most promptitude, energy, care, and skill; and all who prove indolent or ungovernable excluded at first from all part in labor, and speedily, if not thoroughly reformed, from the institution itself; and here, again, let the law of nature, instead of the law of rakes and dandies, be regarded, and the true impression ever made on the mind of all around, that *work alone is honorable*, and indolence certain disgrace, if not ruin.

At some convenient season of the year, the commencement, or *annual fair*, of the university should be holden through a succession of days. On this occasion the doors of the institution, with all its treasures of art and resources of knowledge, should be thrown open to all classes, and as many other objects of agricultural or mechanical skill gathered from the whole State as possible, and presented by the people for inspection and premium on the best of each kind; judgment being rendered, in all cases, by a committee wholly disconnected with the institution. On this occasion all the professors, and as many of the pupils as are sufficiently advanced, should be constantly engaged in lecturing and explaining the divers objects and interests of their departments. In short, this occasion should be made the great annual *gala day* of the institution, and of all the industrial classes, and all other classes in the State, for the exhibition of their products and their skill, and for the vigorous and powerful diffusion of practical knowledge in their ranks, and a more intense enthusiasm in its extension and pursuit.

As matters now are, the world has never adopted any efficient means for the application and diffusion of even the practical knowledge which does exist. True, we have fairly got the primer, the spelling-book, and the newspaper abroad in the world, and we think that we have done wonders; and so, comparatively, we have. But if this is a wonder, there are still not only wonders, but, to most minds, inconceivable miracles, from new and unknown worlds of light, soon to break forth upon the industrial mind of the world.

Here, then, is a general, though very incomplete, outline of what such an institution should endeavor to become. Let the reader contemplate it as it will appear when generations have perfected it in all its magnificence and glory; in its means of good to man, to *all men* of *all classes;* in its power to evolve and diffuse practical knowledge and skill, true taste, love of industry,

and sound morality—not only through its apparatus, experiments, instructions, and annual lectures and reports, but through its thousands of graduates, in every pursuit in life, teaching and lecturing in all our towns and villages; and then let him seriously ask himself, is not such an object worthy of at least an effort, and worthy of a State which God himself, in the very act of creation, designed to be the first agricultural and commercial State on the face of the globe? . . . .

But such a system of general education as we now propose would (in ways too numerous now to mention) tend to increase the respectability, power, numbers, and resources of the true professional class.

Nor are the advantages of the mental and moral discipline of the student to be overlooked; indeed, I should have set them down as most important of all, had I not been distinctly aware that such an opinion is a most deadly heresy; and I tremble at the thought of being arraigned before the tribunal of all the monks and ecclesiastics of the Old World, and no small number of their progeny in the New.

It is deemed highly important that all in the professional classes should become writers and talkers; hence, they are so incessantly drilled in all the forms of language, dead and living, though it has become quite doubtful whether, even in their case, such a course is most beneficial, except in the single case of the professors of literature and theology, with whom these languages form the foundation of their professions, and the indispensable instruments of their future art in life.

No inconsiderable share, however, of the mental discipline that is attributed to this peculiar course of study, arises from daily intercourse, for years, with minds of the first order in their teachers and comrades, and would be produced under any other course, if the parties had remained harmoniously together. On the other hand, a classical teacher who has no original, spontaneous power of thought, and knows nothing but Latin and Greek, however perfectly, is enough to stultify a whole generation of boys and make them all pedantic fools like himself. The idea of infusing mind, or creating or even materially increasing it, by the daily inculcation of unintelligible words—all this awful wringing to get blood out of a turnip—will, at any rate, never succeed except in the hands of the eminently wise and prudent, who have had long experience in the process; the plain, blunt sense of the unsophisticated will never realize cost in the operation. There are, moreover, probably, few men who do not already talk more, in proportion to what they really know, than they ought to. This chronic diarrhœa of exhortation, which the social atmosphere of the age tends to engender, tends far less to public health than many suppose. The history of the Quakers shows that more sound sense, a purer morality, and a more elevated practical piety can exist, and does exist, entirely without it, than is commonly found with it. . . .

Indeed, I think the exclusive and extravagant claims set up for ancient lore, as a means of disciplining the reasoning powers, simply ridiculous when examined in the light of those ancient worthies who produced that literature, or the modern ones who have been most devoted to its pursuit in this country and in Europe. If it produces infallible practical reasoners, we have a great many thousand infallible antagonistic truths, and ten thousand conflicting paths of right, interest, duty, and salvation. If any man will just be at the

trouble to open his eyes and his ears, he can perceive at a glance how much this evasive discipline really does, and has done, for the reasoning faculty of man, and how much for the power of sophistical cant and stereotyped nonsense, so that if obvious facts, instead of verbose declamation, are to have any weight in the case, I am willing to join issue with the opposers of the proposed scheme, even on the bare ground of its superior adaptation to develop the mental power of its pupils.

The most natural and effectual mental discipline possible for any man arises from setting him to earnest and constant thought about things he daily does, sees, and handles, and all their connected relations and interests. The final object to be attained, with the industrial class, is to make them *thinking laborers;* while of the professional class we should desire to make *laborious thinkers;* the production of goods to feed and adorn the body being the final end of one class of pursuits, and the production of thought to do the same for the mind the end of the other. But neither mind nor body can feed on the offals of preceding generations. And this constantly recurring necessity of reproduction leaves an equally honorable, though somewhat different, career of labor and duty open to both, and, it is readily admitted, should and must vary their modes of education and preparation accordingly. . . . (7—75–89) (8—66–79)

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CHAPTER XI

The Development of Art Education in Relation to Industry

89. **Early Art Schools in Italy.** No history of manual and industrial education could be satisfactory that failed to consider the teaching of the arts of painting, sculpture, engraving, and designing in their relation to the crafts and the various manufacturing industries. Neither could it be considered adequate unless it recognized the progress of industrial art education as a factor in public education. In the preceding chapters many references have been made to the teaching of drawing—especially drawing in connection with the study of geometric and natural forms and with technical drafting for industrial purposes. This chapter will deal with a few significant facts in the development of that side of industrial education which had its origin in what are often termed the fine arts. These facts will be presented to show how industry—especially competitive industry—called for the assistance of the fine arts. They will also indicate how the expansion of industrial art training stimulated the demand for art instruction as a part of general education. In order to do this it seems necessary to begin with some of the early art academies and museums of Italy.

The early art academies were of two types: A few were private enterprises conducted by noted masters, but most of them were organized and maintained by guilds, many of which were formed with a religious motive. A very early private academy was established by Eupompus at Sicyon near Corinth in Greece about 400 B.C. It is said that this school became so celebrated that the art of drawing was established as one of the necessary branches of a liberal education. (1—2) A celebrated private art school of later times was that of Francesco Squarcione at Padua in the early half of the fifteenth century. It appears that Squarcione was the first to make a museum col-

lection of drawings and ancient works of art for the purpose of giving instruction to pupils. He went to Greece and traveled throughout Italy in making this collection. His school was very popular. At one time he had 137 pupils which was an exceptionally large number to study under one master. (1—2)

Before 1499 Leonardo da Vinci had established an academy in Milan, but as this was merely a private school it ceased to exist after a few years. (1—6) A celebrated private art academy was that of Lodovico Carracci at Bologna. This was so popular that all other private art academies in the city were obliged to close because they had no pupils. (1—7) It is said to have been Carracci who brought about "the separation of the painters from the artisans, with whom they were united in the common guild." (1—6) In Bologna, also, there was an academy established by Francesco Ghisiglieri which opened a "living model school" in 1686, but it did not continue for many years. (1—6)

One of the oldest of the guild schools was that of St. Sophia in Venice established about the middle of the thirteenth century. The name St. Sophia suggests that it was probably established by Greek artists who migrated to Italy after the capture of Constantinople by the Venetians in 1204. The name of this guild is noticeable because of the fact that St. Luke is nearly always the patron saint of similar societies of painters. (1—3) This was due to a tradition which has been traced back to the tenth century that St. Luke was not only the "beloved physician" but also a painter. He is supposed to have painted pictures of Christ and especially of the Virgin Mary which he used in making many converts. This tradition accounts for the fact that in Florence, where the citizens were divided into twenty-one guilds, the painters were in the same guild as the surgeons, and apothecaries. "After the time of Giotto, however, there was founded, besides the old guild, a separate brotherhood of painters called the Society of St. Luke which was not a civic corporation, but rested on a religious basis, and at the same time promoted social relations between fellow-craftsmen. This society was founded A.D. 1349." (2—452) In Siena there was an old corporation of painters, probably dating

back as far as the one at Venice which recognized St. Luke as its patron and fined every member ten florins who did not attend the annual festival on St. Luke's day and carry a wax torch in the procession. (1—4) In Milan also there was an old guild of painters. There was an academy of fine arts established in Perugia in 1573 and one at Rome before the end of the sixteenth century. (1—7)

Meanwhile Italy was becoming a nation of busy workshops where refinement of taste and the principles of design were applied by skilled craftsmen. Glass, mosaics, lace, metalwork, carving, and silk weaving are a few of the crafts in which Italy excelled. It is not surprising therefore that Italy was the mother country for the fine arts of Western Europe, and many of the industrial arts also, and consequently the country to which students went from the northern countries and from Britain to get instruction, and from which artists and craftsmen were sometimes imported in order to give instruction.

90. **The Progressive Policy of France in Developing Art Instruction.** As early as 1391 there was a "privileged company of St. Luke" in Paris. This guild, however, included not only painters and sculptors but also "various kinds of artisans." The painters and sculptors were only a small minority and consequently their influence was relatively insignificant. (1—8)

At the opening of the Renaissance in Italy the city of Tours was the art center of France. It was also the home of the French kings. Moreover, Tours was a manufacturing center. It was the chief home of the silk industry which Louis XI established in 1470 by removing a colony of Italian silk workers from Lyons where they had not been successful. (3—162) At this time the court painter to the king was Jean Fouquet (1415–1480) the most noted French painter of the fifteenth century. He was the leader of a group of painters in Tours; he had received his training in Italy. The same could be said of many other leaders in the art world of that period; they were taught in Italy. Charles VIII went so far as to import famous Italian artists to settle in Tours. (3—162) It was in Tours under the influence of Louis XI that artists were freed from the narrow activ-

ities and rigid rules of the guilds. Here they were brought into contact with men and women of the highest intelligence and social grace, but the arbitrary action of the guilds continued very generally until the founding of the French Academy of Painting and Sculpture in 1648. (4—8)

As late as 1620 the Society of St. Luke went so far as to prohibit artists from assembling pupils around a model and from selling or freely exchanging their works, "without proving five years of apprenticeship and four of journeymanship." (4—20) This regulation grew out of a desire to insure honest workmanship for the church but it fell into the wrong hands to administer and it was resented by some of the leading young artists of the time. A story is told of a company of artists, among whom was LeBrun, later the first president of the French Academy, who hid themselves in a cellar while drawing from their model who was a drinking cobbler. They were pursued by the Society of St. Luke in every way that the law permitted. (4—20)

While the Italian influence was strong in Tours the Flemish artists were exerting a strong influence upon the artists of Paris. Early in the sixteenth century Francis I moved his court to Fontainebleau, which united the schools of Tours and Paris, and "a brilliant period of art production followed." (4—9)

In 1539 Francis I brought Flemish workmen to Fontainebleau and established a factory for the making of tapestry. This factory was continued for a hundred years and then was taken over by the government under Louis XIV, thus securing to France the famous Gobelein products. (5—20)

In the sixteenth century, also, enamel work won a high reputation. In Limoges, the center of this industry, were many skilful craftsmen.

The outstanding event of the seventeenth century was the founding of the French Academy of Painting and Sculpture in 1648. This act was of great importance because through it the government assumed responsibility for the promotion of art and because, in time, it made Paris the art center of the world. The Academy was organized to develop talent without limitations of nationality or sex. It provided a system of thorough

and well-supervised instruction. It included a school in which drawing from the nude was taught by the greatest French masters. This school later became the present famous *École des Beaux Arts.*

Within a few years it extended the plan of instruction to include supplementary training in Rome, at what was known as the French Academy of Fine Arts at Rome. Out of the exhibitions of the Academy in Paris grew the great annual salons which have been the center of interest for the entire art world. (4—24, 25)

Early in the eighteenth century, following the example of Paris, academies of fine arts began to spring up in the provincial cities. In 1710 a society of artists was formed at Nancy; one had risen at Toulouse in 1750; one the same year at Rouen; one at Marseilles in 1753; one at Bordeaux in 1763; and one at Dijon in 1767. Others were at Rheims, Pau, Metz, Clermont Ferrand and Amiens. Earlier than all of these was one at Lyons where silk pattern designers were trained, dating back to the seventeenth century. (4—82)

Continuing the policy of leadership in the development of the art industries, the government in 1756 took over the porcelain works at Vincennes and moved it to Sèvres and encouraged its workers to produce porcelain of the highest merit without regard to cost. (5—20) While art was still a luxury in many other countries France made it a matter of business—even a matter of national policy. Moreover, in these government industries as well as in the schools, as time went on, generations of workmen were trained under such favorable circumstances that there is no wonder that France led all the other nations in the art industries.

It is significant that government officials in the fine arts were always members of the French Academy. These included the director of the Gobeleins, the superintendent of the porcelain factory at Sèvres, the conservator of the pictures at Versailles and of the Royal Museums, and the painter to the king. In the Middle Ages great painters and sculptors were often expert craftsmen. The lines between artists and craftsmen had not yet been drawn. There was a strong tendency to separation

in France, but this was checked by the government plan of administration of art and especially by the system of training workers at the manufactories of Sèvres and the Gobeleins. (5—29)

In 1793 the Revolution abolished the French Academy and with it the art schools in all the provinces. (4—83) In place of it, however, was established, in 1795, the National Institute of France in which literature and the fine arts formed one section. This was divided into eight classes, three of which were painting, sculpture, and architecture. The nineteenth century opened in France with a contempt for all things antecedent to the Revolution, but Napoleon's vigorous conduct of affairs gave a new impulse to art. "Art treasures from Italy, from the entire European world, in fact, continued for the first six years of the century to flow into Paris." (4—126) By 1805 the reconstruction of the Louvre had been begun in order to find appropriate places for the new art treasures, and the Luxembourg had been made a public gallery. (4—127) During the same period twenty-two museums were established in the provinces to take the overflow of pictures from the Louvre. These were at Nancy, Lille, Toulouse, Nantes, Rouen, Lyons, Strasbourg, Dijon, Mayence, Bordeaux, Marseilles, Geneva, Caen, Rennes, Brussels, Montpelier, Tours, Grenoble, Angers, Le Mans, Autun, and Amiens. (4—127, 128) (cf. 75)

91. **Early Schools of Art in Great Britain.** In one very important respect the history of art instruction in Great Britain is in definite contrast with that of France. In Britain the instruction sprang from individual impulse and effort while in France it was constantly being promoted by the government. While the kings of France were bringing artists and industrial art workers from Italy, England was giving little or no thought to art as a national asset. English kings and queens were the patrons of art but they had no far-reaching plan of national development which they were working out, as had the sovereigns of France. Hence Britain was many years behind France in the establishment of its schools for training artists. (5—19)

What is often referred to as the earliest art school in England, the Museum Minerva, established by Charles I in 1636, was

not so much an art school as a school for the liberal education of gentlemen. This is supposed to have been established as the result of the report of a committee of the House of Lords which was to consider schools for training young men for the public service. The plan of this school called for instruction in "arts and sciences, foreign languages, mathematics, painting, architecture, riding, fortification, antiquities, and the science of medals." (6—149, 150)

The school was opened at the home of the regent, Sir Francis Kynaston, in Covent Garden, but it did not last more than a few years.

During the early years of the eighteenth century and, in fact, during the greater part of it, there was no opportunity in England to receive the analytic art training so much needed. Most of the painters of that period learned by the individual instruction method. The young artists were not trained in a section of the subject at a time—as first in drawing from the antique, then in work from life, and later in composition. Each student attacked his problem as a whole; he was not taught to divide it into its component parts. While this method may have had its advantages in producing certain geniuses, it was difficult, and the need was felt for more analytic methods of teaching and a consequent demand for schools of art. (7—Chap. I)

In 1711 some of the leading painters of London opened an academy of painting with Sir Godfrey Kneller in charge. (6—470) In 1724 an academy for drawing was opened in Covent Garden by Sir James Thornhill. This, however, was a private school and was discontinued when Thornhill died in 1734. (6—328) (8—II, 134)

A few years after the closing of the Thornhill school several of the artists who had been in that school and desired a place to study a living model came together and occupied a room in the house of a painter in Arundel Street. Here they were joined by others including Hogarth. In 1738 they moved to larger quarters in Peter's Court, St. Martin's Lane, where they continued until 1767. But this also was a private institution and did not supply the needs of the profession. (8—II, 135)

In 1760 a group of these London artists offered to give paintings to a foundling hospital because the walls were bare and the charity funds could not be spent for decorations. These paintings formed an exhibition to which certain persons were admitted by ticket. This made such a favorable impression upon the public that it suggested to the artists the idea of holding a large public exhibition of British works of art. The great hall of the Society of Arts was secured and in April, 1760, the first regular exhibition of the works of British artists was opened. To this Sir Joshua Reynolds sent four pictures. The success was greater than was expected and it was continued each year. (8—II, 136, 137)

On the strength of this public recognition, the artists sought and obtained a royal charter of incorporation from George III in January 1765. (8—II, 142) Unfortunately, dissension arose among the artists themselves. Some malcontents organized and succeeded in forcing out of the board of directors many of the ablest and best men in the society. These outvoted artists, however, with others who were in sympathy with them, formed a new group and solicited royal patronage. The king granted their petition. Meanwhile members of the group had aroused the interest and sympathy of Sir Joshua Reynolds, who was then the recognized leader among English painters, and gained his consent to become the first president of the Royal Academy. The first meeting of the members was held on Dec. 10, 1768. (8—II, 146)

For the first two years the Royal Academy occupied rooms in Pall Mall. Then the king granted it the use of a part of the old Somerset House. (8—II, 147) (Fig. 31)

While this development was taking place in England, schools were also being established in Scotland and Ireland. In 1727 there was formed in Scotland a Board of Trustees for the Encouragement of Manufactures. Before 1834 the Board established a school at Dunfermline to teach pattern drafting for table cloths, diapers, etc. Beginning about 1766, the Board made an annual grant of £430 to a drawing academy which had been established to enable the Scottish industries to be

independent of foreign designers. The school was a great success, especially in the higher branches of art. (5—22)

The Dublin Society, which was founded as early as 1731 claims to have been the first body in Great Britain "to offer premiums for the encouragement of drawing and the promotion of art." In 1741 the Society established a free drawing

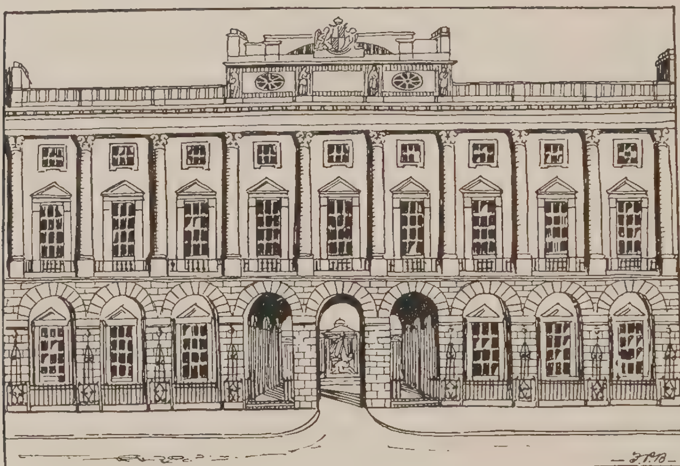


Fig. 31. Somerset Palace, The Strand, 1837
From *South Kensington and Its Art Training* by Frank P. Brown

school in order to advance the arts. This school has since been successful in training architects, sculptors, designers, and pictorial artists. (5—23)

While the Royal Society of Arts (the full title of which was The Society for the Encouragement of Arts, Manufactures and Commerce) was in process of formation in London in 1755, William Shipley, the first secretary of the society, an artist and the master of a private drawing academy, proposed that the new Society "bestow premiums on a certain number of boys and girls under the age of sixteen who shall produce the best piece of drawing, and show themselves most capable when properly examined, . . . it being the opinion of all present that the Art of Drawing is absolutely necessary in many employments, trades and manufactures."(9—15) At an early

meeting of the Society funds were provided and a competition was announced. This and similar actions established the policy of the society until it was often known as the "Premium Society."

At first the premiums were intended to stimulate art as applied to manufactures but they gradually changed to include pictorial art. Many men who became professional artists found the first public recognition of their talent in these prizes of the Royal Society.

In one of the earlier premium lists prizes were offered for "the most ingenious and best fancied designs, composed of flowers, fruit, foliage, and birds, proper for weavers, embroiderers, or calico printers." In other lists there were prizes for designs for cabinet makers, coach makers, and manufacturers of iron, brass, china, earthenware and including "any other Mechanic Trade that requires Taste." (9—152, 153)

A little later prizes were added for engraving, mezzotint etching, wood-engraving, gem-engraving, cameo cutting, mechanical drawing, architectural design, furniture design, etc. At first all these prizes were for boys and girls. A little later some prizes were for young people up to twenty-five years of age, and still later some were given without reference to age limit. (9—155)

The founding of the Royal Academy in 1768 did not affect the work of the Royal Society of Arts as much as might have been expected because the Academy confined its instruction to a selected few students who had special talent, while the Society kept its competitions open to a much larger number. (9—155) The Academy aimed to train painters, sculptors, and engravers and to raise the standard of the fine arts in Britain; the Society sought to produce superior designers and industrial workers and to raise the standard of taste among the people.

92. **The Establishment of the British System of Industrial Art Training.** In 1830, the House of Commons appointed a committee "to inquire into the best means of extending a knowledge of the arts, and of the principles of design, among the people (especially the manufacturing population) of the

country; also to inquire into the constitution, management, and efforts of institutions connected with the arts." "The inquiry was continued in the session of 1836, and the Committee divided the subject of investigation into three parts: (1) the state of art in this country and in other countries, as manifested in their different manufactures; (2) the best means of extending among the people, especially the manufacturing classes, a knowledge of and a taste for art; (cf. 15) (3) the state of the higher branches of art, and the best mode of advancing them." (5—30)

The committee examined a great number of witnesses on the Continent and in England, and concluded that there "was a most lamentable deficiency of taste and artistic knowledge" in the designs used in the industries, and that manufacturers were "greatly dependent on foreign skill, owing to the dearth of English designers." (5—30) One of the committee said that there was no doubt about the superiority of French designs or of their importance in commerce. "Of her silk manufactures, for example, five-sixths of her whole production were exported, whilst of the silk manufactures of England, probably not more than one-eighth or one-tenth was sent to foreign countries. The reason for this was to be found in the superior excellence of French designs." (5—31)

"It was shown that whereas there were no means of obtaining adequate instruction in England, there were in France about eighty schools of design, under the superintendence and partial support of the Government, and, generally speaking, they were open and free, and so popular that it was impossible (especially in Lyons) to provide for all who desired to enter them. In Bavaria, where linear drawing was taught in every village school, (cf. 62) there were thirty-three schools of design in which art students spent three years after leaving the village schools, ultimately finishing their education in one of the three polytechnic schools; and similar instruction was imparted in Prussia, Switzerland, and other European countries." (5—32)

The report was favorably received and the Government allowed the sum of £1,500 to be included in the estimates for

the establishment of "a Normal School of Design, with a Museum and Lectures." (5—35)

"On the 1st of June, 1837, the new School of Design was opened at Somerset House, in rooms formerly occupied by the Royal Academy." The object of the school was stated as being "to afford the manufacturers an opportunity of acquiring a competent knowledge of the fine arts, in so far as these were connected with manufactures, and that steps ought to be taken to limit the students to these interests." (10—4)

Previous to the appointment of the Parliamentary committee and during the passage of the Act establishing the School of Design some sharp differences of opinion had arisen in reference to the best means of supplying the demand for more and better designers. Benjamin Robert Haydon (1786–1846), a London historical painter and teacher of art, who had been influential in the appointment of the committee, believed in the establishment of a great central school of design in London, which would be independent of the Royal Academy, and have branch schools in the provincial towns. He would have the course of instruction in each of these the same, "though in different degrees for artists, artisans, and amateurs, and to be based on a knowledge of the human form, the source of all fine art." Haydon's plan was opposed by those who wanted merely to teach pattern drawing to artisans and also by members of the Royal Academy who wanted to keep separate the fine arts and the industrial arts and to have the new school subsidiary to the Academy. (11—I, 464)

This difference in viewpoint was carried over into the management of the school itself which was placed under the Board of Trade, which body turned over the control of instruction to a Council which included prominent artists, some of whom were members of the Royal Academy. Although the plan of Haydon was finally adopted it was not fully accepted at first, and was thwarted for a long time. This caused frequent changes in the regulations governing the school. An example of this is found in the decisions in reference to the study of the human figure: In July, 1837, the Council resolved "that drawing from the human figure should not be taught to the stu-

dents," but in August, 1838, it resolved "that the human figure for purposes of ornament be taught in the school." (10—4) In January, 1840, the Council decided that the drawing of the human figure should be taught "subsequent to a course of ornamental design." (10—5) How to draw the line between "fine" and "applied" art was difficult, especially when some of the graduates of the schools were becoming painters instead of industrial designers.

In general, the course of instruction consisted of two parts. In the first part instruction was given in the drawing of ornament in outline and light and shade, in drawing the human figure, in work with color, and in modeling. In the second part, instruction was given in the history of ornament and in the application of design to the manufacturing industries—especially to the textile industry.

In the year 1840 the Government appropriated £10,000 for starting schools of design in the large towns. This fund was "to be devoted to the tuition and payment of teachers, the purchase of casts and the preparation of models for the use of schools." This was the official beginning of the system of art instruction that developed rapidly during the next few years. Aid was offered to eighteen large towns. The first to avail themselves of this offer were Manchester, Birmingham, and Coventry. (10—5) By 1850 there were about twenty such schools of design in Great Britain and Ireland. (12—95) While these schools, which up to this time had been attended by 15,000 to 16,000 students, must have had some effect upon the manufacturing industries and upon the taste of the young people of the nation, it still remained true that foreign designs were copied and adapted by British manufacturers. (12—95)

The great awakening came in 1851 at the World's Fair held in the Crystal Palace in London. This exposition was an effort on the part of British manufacturers to demonstrate to the world the superiority of British manufactured articles. Instead of the desired result, however, it furnished ample proof that in industries where taste and design were involved, French manufactured articles were superior to those of Great Britain. The real and valuable result of the exposition was a

great stimulation of art and industrial education in Britain: (1) The exposition revealed to the people a higher standard of art in industrial products; it awakened in them a love for the applied arts. (10—10) (2) It helped the English leaders in industrial art education to discover some of the handicaps and deficiencies of the schools they had established. (10—12) (3) It aroused both manufacturers and art educators to a realization of the importance of educating public taste as well as producing designers—to the importance of teaching art in the elementary schools of the nation. (10—12, 13) (4) It caused the Queen, in her address to Parliament, to emphasize the importance of better facilities for education in art and science in relation to industry. (5) It made possible the establishment of the Albert and Victoria Museum at South Kensington. The site for this was purchased for £60,000 taken out of the surplus funds of the exposition. Many of the art objects first placed in the museum were those selected from exhibits at the exposition. (10—14) In 1852 a new board of management for the Government art schools was formed and called the Department of Practical Art. The central school was moved to Marlborough House, the Queen having turned over sixty rooms for the use of the new department. (10—12) The next year the scope of the department was enlarged to include science, and the name was changed to The Science and Art Department. About this time (1852) the objects of the school were defined as follows:

> Firstly, general elementary instruction in Art, as a branch of national education among all classes of the community, with the view of laying the foundation for correct judgment, both in the consumer and the producer of manufactures;
>
> Secondly, advanced instruction in Art, with a view to its special cultivation; and
>
> Lastly, the application of the principles of technical art to the improvement of manufactures, together with the establishment of museums, by which all classes might be induced to investigate those common principles of taste which may be traced in the works of excellence of all ages. (10—8, 9)

After four years more, in 1857, the management of the art schools was transferred from the Board of Trade to the Committee of Council on Education (cf. 60), and shortly after this

the school and the museum and the library connected with them were moved from Marlborough House to the new building which had been erected for the purpose at South Kensington. (13—151)

Thus it was that, through the great exposition of 1851 and what followed immediately after, the foundations were laid for a system of art instruction in Great Britain and Ireland which developed rapidly. From 1850 to 1863 the number of provincial art schools increased from 16 to 91, and the number of students from about 3,000 to 15,788. (5—57) (12—96) By 1872 the number of schools had increased to 122. Besides the students in these industrial art schools, 194,549 children were receiving instruction in drawing in the "schools for the poor." There was "one well-appointed art school of 190 students for every 210,000 of the population." (14—50)

One of the results of this rapid development of art instruction was that "at the Paris Exposition of 1867 England stood in the first rank of artistic nations, and even surpassed some of those who previously had carried off the highest honors." (14—50) In fact, this great advance in artistic production since 1851 so alarmed the French that they in turn "began to reconstruct, improve and increase their art schools." (14—51)

Throughout this development one of the great problems had been to obtain adequately trained teachers. When the schools were established in the provinces a probationary normal class of ten students was started at the School of Design at Somerset House, and a regular normal class the next year, 1841. Out of this was evolved a system of training and assistant teaching, but it proved unsatisfactory. Then it was proposed to appoint experienced artists to teach in the provincial schools and to require them to attend school at Somerset House for eight months, after which they were to spend four months in travel and study on the Continent under the guidance of the Council. (13—490) But this plan was not generally adopted and no other took its place for some years. Whenever an application for a teacher was received from a provincial school the director of the School of Design merely selected one of his students who

had shown particular ability, and if he was willing to become a teacher he was recommended. (13—491)

Nothing approaching an adequate system of training for industrial art teachers was put into operation until 1852, shortly after the creation of the Department of Practical Art.

The regulations for admission to this training class were drawn out with considerable care. Specimens, consisting of outline and shaded drawings of ornament, ornament coloured or modelled, flowers, etc., from nature, and models or drawings of the human figure were required to be sent in by each candidate. He was to have a good knowledge of the elements of Geometry, and some acquaintance with French, German and Italian languages. During his stay at the school his whole time was to be devoted to study; and before being recommended to the local School of Art, it was necessary for him to pass through a special course of Drawing, Painting or Modelling the human figure. In addition to this each candidate was to pursue a course of study with a view to his becoming acquainted with the peculiar manufactures of the district in which he was desirous of obtaining an appointment. This course consisted either of practical art applied to casting, chasing and embossing metal, suitable for a teacher at such a place as Sheffield or Birmingham; or of art as applied to china-painting for one likely to go to the Potteries; or of art applied to calico-printing, etc., for Manchester, and so forth. At the completion of the course of study, an examination was held; and certificates were given setting forth the stages in art in which each candidate had been successful. (13—491)

When the School of Design was moved to Marlborough House the training of teachers became the main purpose of the school. Later, at South Kensington it was known as the National Art Training School, and still later, in 1896, it became the Royal College of Art. (12—96) The training covered from one to five and sometimes six years. The course included not only study in the school but also practice teaching in the elementary schools of London. (13—496)

In 1857 it was agreed that teachers in elementary schools should have their salaries increased by £5 "if they had passed examinations in drawing and taught the subject successfully in their schools." (12—487)

In the year 1863, in harmony with the original intent of the school, provision was made for national scholarships which would enable advanced students who had given evidence of special ability in design and who desired to become industrial designers to study at the National Art Training School. About

this same time special efforts were made to meet the needs of artisans through evening instruction. Classes were opened in the smaller towns where the maintenance of a full-time art school would not have been feasible. To assist in the development of worthy standards in the provincial schools the museum inaugurated a system of loaning objects of art, and later these schools were aided by money grants for the purchase of "historic objects of industrial art." (12—96)

93. **Art Instruction in Germany and Other European Countries.** While Italy first, then France, and later England, were taking the lead in the promotion of art instruction as a national policy, a similar development was taking place to a considerable extent in the other European countries. In Germany, as early as the thirteenth century the city of Augsburg is said to have had a guild of painters with St. Luke for its patron. At a very early date there was a guild of painters in Antwerp, and in 1510 an academy was established there. Later, in 1663, it was made a royal academy by Philip IV of Spain. The first academy in Germany was opened in Nuremberg in 1662. The painters of Amsterdam were incorporated in 1654 and established an academy. The Hague followed in 1656 with an incorporated society of artists which opened an academy in 1682. The Royal Academy of Art in Berlin, patterned after the academies at Rome and Paris, was established in 1699. Dresden and Vienna opened academies in 1705. Then followed Bruges in 1720, Stockholm in 1733, Madrid in 1752, Copenhagen in 1754, St. Petersburg in 1765, Düsseldorf in 1767, Valencia in 1768, Brussels in 1770, Barcelona in 1788, and the Royal Academy at Munich in 1808. (1—9–14)

In 1780 a school of design "for the improvement of manufacturers" was opened in connection with the academy at Augsburg. This was under the management of a society organized for the promotion of the arts. "The object of this school was to instruct youths and grown-up persons occupied in mechanical trades and in manufacturies, in the principles of ornamental design, for the improvement of patterns of all descriptions." (1—11)

Early in the nineteenth century a movement began in Germany to make drawing an important part of the instruction in elementary schools. This movement, however, did not receive its greatest impulse from art but from science. The scientists, led by von Humboldt, advocated drawing in the elementary schools to develop "talent for observation and delineation," (16—I, 238) (cf. 62) (cf. 79)

At the World's Fair in London, in 1851, Germany as well as England learned that if she was to compete successfully with France in the world's market for manufactured goods she must improve the character of the designs used in her industries, and she must develop the artistic taste of her workers. Immediately there grew up a demand in the industrial centers of Germany for art instruction, especially in evening classes of industrial workers. (cf. 79) There was also a demand for museums where industrial workers could study the finest examples of industrial design, both ancient and modern, from other countries. One result was the establishment of the Royal School of Art Industry in Munich in 1855. Another was the establishment of museums in rapid succession—Berlin, 1866; Nuremberg, 1868; Weimar, 1869; Dresden, 1869; and smaller museums at Stuttgart, Cologne, Mayence, Darmstadt, Karlsruhe, Salzburg, and Augsburg. However, the strong forward movement for industrial art education in Germany as part of a national economic policy awaited the statesmanship of Bismarck after the Franco-Prussian War of 1870–71. This development, therefore, belongs to a later period than the one at present under consideration.

94. **Early Art Development in Philadelphia.** If it is true that in Germany the modern movement for industrial art education took place in a later period than the one at present under consideration, it is still more true of industrial art education in the United States. It is, in fact, quite common to date all development in public school art instruction and industrial art in higher schools from the coming of Walter Smith from England to Massachusetts in 1872. There was, however, a valuable preparation for the industrial art movement of the seventies which belongs to the period now under consideration.

During Colonial times there was but little use for applied art outside of the home industries, because the policy of England was to prohibit manufacturing in the colonies in order to keep them as her own particular and permanent customers for English-made goods. (11—I, CXCII) (cf. 88)

This, however, did not apply to painting and sculpture, for as soon as there were events in the colonies to look back upon as important in history, and personages of outstanding character and influence, there was subject-matter for the painter and the sculptor and a demand for their products. Tuckerman tells us that there were limners in Boston as early as 1667. (20—7) In 1711 Gustavus Hesselins came to Philadelphia from Sweden to paint "an alterpiece for St. Barnabas' Church in Queen Anne's Parish in the Province of Maryland." This is said to have been the first public art commission in this country. (18—v) John Watson, a Scotch portrait painter, established himself at Perth Amboy, New Jersey, in 1715 and "acquired a handsome competence by his labors." (20—41) Another Scotchman, John Smybert, (1684–1751) came to Rhode Island in 1729. A little later he settled in Boston where he married a lady of fortune and painted portraits of prominent people in Massachusetts. (20—41) (6—332) His portraits are said to have been the best ones painted in America during that early period, and from his work several young American painters, who later became distinguished artists, gained their first ideas of color and drawing. (20—43) The source of the ideas, however, was Italian, for Smybert had "spent three years in Italy, copying portraits of Raphael, Titian, Van Dyck, and Rubens." (6—332) Toward the end of the Colonial period interest in painting, especially portrait painting, increased and during the early days of the Republic, stimulated by the brilliant social life that surrounded President Washington, this form of art became popular in Philadelphia, the capital city.

It should be recalled that in those days Philadelphia was "the metropolis of the New World, the center of its cultivation and learning." It was quite natural that such a city should attract artists from Europe as well as doctors and merchants. Often they were the teachers of young Americans who wished to

become artists. Such a teacher was William Williams, an Englishman who taught Benjamin West (1738–1820) America's first great painter, before he went to study in London. (18—38) It was quite natural also that in such a city should be found the earliest American-born artists to gain local distinction. It is claimed that James Claypoole, born in Philadelphia in 1720 was the first native American painter, and a similar claim is made for William Rush, sculptor, born in 1756. (18—v)

It is a significant fact that most of the famous painters of the early American group finished their training in London under the guidance of Benjamin West, "the Quaker boy who became president of the Royal Academy" following Sir Joshua Reynolds. (17—13) Among those who studied under West the first was Matthew Pratt (1734–1805), who at the age of fifteen had been apprenticed to his uncle, James Claypoole, who instructed him "in all the branches of the painting business, particularly portrait painting." (18—60) Then came Charles Willson Peale (1741–1827), whose name is the most prominent among the promoters of art during that early period in Philadelphia. Later there came Gilbert Stuart (1755–1827), the greatest of the early American portrait painters; John Trumbull (1756–1843), of New York, whose historical paintings are in the rotunda of the capitol at Washington and at Yale University; and Thomas Sully (1783–1872), the most prominent portrait painter in Philadelphia for a generation after his return from London.

West took some of these young American painters—Pratt and Stuart, for example—into his own home for four or five years, during which time, as apprentices, they not only received instruction while working with him, but they were introduced to his friends. They were thus given exceptional opportunities to become acquainted with some of the leaders in social and political life in England at that time. This was a great advantage, not only while they remained in London but also when they returned to America.

An interesting side light on this apprentice training under West is found in a statement made by Stuart. He is quoted as saying, "When I had finished a copy of a portrait for my

old master, that I knew he was to have a good price for, and he gave me a guinea, I used to think it hard—but when I looked on the establishment around me, which with his instruction I enjoyed, and knew it was yet to be paid for, I fully exonerated West from the charge of niggardliness and cheerfully contributed my labour in return for his kindness." (18—74)

After Charles Willson Peale returned from London he was employed in painting portraits in Baltimore and Annapolis, and in 1772 he was invited to Mount Vernon where he painted Colonel George Washington. Peale became a soldier of the Revolution and while in the army took advantage of his opportunity to paint portraits of many of the leaders to place in a national gallery which he thought should be established. In 1784 he found a place in his own residence in Philadelphia for his museum of historical portraits. After ten years its scope was extended to include specimens of natural history and was moved to the building of the American Philosophical Society. Eight years later, 1802, it was placed in the State House. (18—65)

In 1791 Peale started a drawing school. Again in 1794 he projected an organization known as the Columbianum, or American Academy of Painting, Sculpture and Architecture. For this organization there were collected a few casts of antique sculpture, the most important of which was the Venus de Medici. With these casts for models he started a drawing class. But the Venus had to be kept shut up in a case when not used by the class "as the manners of our country at that time would not tolerate a public exhibition of such a figure." Peale attempted, also, to start a life class but he had to do it without professional models. (18—3) After more years of continuous effort in the interests of art, Peale and his friends saw their vision begin to come true. In 1805, in response to his call, a group of the most progressive citizens of Philadelphia met in Independence Hall and formed the Pennsylvania Academy of Fine Arts, now the oldest art organization in America. In the room where the Declaration of Independence had been signed a quarter of a century earlier seventy-one Philadelphians signed articles of agreement in reference to the promotion of art. The

purpose of the Academy was said to be "to promote the cultivation of the Fine Arts in the United States of America, by introducing correct and elegant copies from works of the first masters in sculpture and painting and by thus facilitating the access to such standards, and also by occasionally conferring moderate but honourable premiums, and otherwise assisting the studies and exciting the efforts of the artists gradually to unfold, enlighten and invigorate the talents of our countrymen." (18—5) The parchment upon which the signatures appeared was dated December 26, 1805. The election of officers resulted in naming George Clymer, a signer of the Declaration of Independence, the first president of the Academy. (18—6) Peale and William Rush, wood-carver and sculptor, were the only two artists on the board of twelve directors. Benjamin West, then president of the Royal Academy, graciously accepted honorary membership in the new Academy and a little later West's two famous Shakespearean paintings, which had been purchased in London by Robert Fulton (1765–1815), inventor and artist, were deposited in the Academy. (18—7, 8) This was the period when Napoleon was flooding Paris with the works of art from the conquered nations. (cf. 90) Through Nicholas Biddle, then secretary to the American Minister in Paris, plaster copies of the choicest of Napoleon's sculptured treasures were made by a distinguished Italian artist and brought to the Philadelphia Academy. (18—10, 11) By the end of the year 1806 a building for the Academy had been erected, the paintings by West had been hung, the antiques from Paris installed, and the exhibition opened to the public on payment of twenty-five cents a head. "In consideration of the unblushing character of the casts" Mondays were set apart "with tender gallantry, for ladies exclusively." (18—13) Thus began the collection of works of art for public exhibition in Philadelphia. Now that a permanent institution had been created, it became the custom among the friends of the Academy to add to its collection by gift or bequest.

But even in these early days of accomplishment there were serious problems to be solved. As already stated, the ratio of

artists to non-artists on the governing body of the Academy was as two to ten. The artists generally had not been invited to join the Academy. (18—30) Moreover, its charter made no mention of a school. The institution was apparently to become a gallery chiefly for the display of antiques. This was not satisfactory to professional artists and students. Consequently in the year 1810 "the Society of Artists of the United States" was formed, the immediate objects of which, according to its constitution, were "to teach the elementary principles of the arts; to encourage emulation by a comparison and communication of ideas; to correct and improve the public taste by stated exhibitions, and to raise a fund for the relief of such members as may be rendered incapable of following their respective professions; or in case of their death, to make some provision for their families.

"To carry these objects into effect, it is in the first instance, proposed to select proper persons to teach the first elements of the arts, and to establish a school for drawing, in all its various branches, and an annual exhibition of the work of art." (19—316, 317)

The Society of Artists began with about sixty members, but within a short time its membership numbered one hundred (18—31) and it had secured the patronage of the President of the United States, James Madison. (19—317)

Efforts were made to bring about a union of the Society of Artists and the Academy but the most that could be done was to get them to join in annual exhibitions, to be held in the Academy building, the first of which was opened in May, 1811. (18—33)

The mooted question of antiques again came up, a number of directors of the Academy being anxious that they should constitute a part of the Annual Exhibition, and wished to appropriate one day in the week for the exclusive admission of ladies. To this the committee of arrangement objected on the grounds rather well taken, "that there never ought to be any public exhibitions where both sexes cannot with propriety be admitted together; and that works of living artists were more immediately interesting, and much better understood by the public in general and also that the Society of Artists was extremely desirous of rendering their exhibition a place of fashionable resort."

The committee of artists won out and the first exhibition consisted of about five hundred works, of which more than one half were by American artists. (18—31, 32)

The exhibition held the following year, 1812, was a notable event in the early history of the combined efforts of the Society and the Academy. It was a triumph for American art.

Another early event in the history of the Academy indicates still further the vital quality of the interest of its founders in the promotion of art. A firm of booksellers, Bradford and Inskeep, had an apprentice who seemed to show exceptional talent in art. At a meeting of the directors of the Academy held May 20, 1811, Mr. Bradford displayed specimens of the boy's work and offered to release him from the remaining five years of his apprenticeship if there was an opportunity for him to study art. This offer was met by the directors who voted one hundred dollars for the boy's outfit and passed a resolution that he be "an *élève* of this Academy." Mr. Inskeep accompanied him to England where he studied at the Royal Academy and with West and Washington Allston (1779–1843), another American painter. Thus it was that the first scholarship pupil of the Academy became the painter and teacher, Charles Robert Leslie (1794–1859), associate of the Royal Academy in 1821, Academician in 1826, professor of drawing at the United States Military Academy at West Point in 1833 for a short time, professor of painting in the Royal Academy, London, from 1848 to 1851 (18—126), and author of several books on painting and painters.

95. **The Struggle for the Recognition of Art in New York City.** Just as New York's place of leadership among the cities of the country came after that of Philadelphia, so in the development of art, its permanent art organizations came into being a score of years after those of Philadelphia, though several early efforts paralleled those of the Quaker City.

In the year 1802 Robert R. Livingston, then ambassador to France, offered to procure casts of the most famous examples of ancient sculpture in the Louvre if the citizens of New York would form an association for the promotion of the fine arts. An agreement was drawn up and signatures secured. By the terms of the agreement the organization was to be called the American Academy of Fine Arts; each subscriber was to pay fifty dollars for each share of stock; and this amount was to be

"remitted to the American Minister at Paris for the purchase of the casts." Edward Livingston, then mayor of New York City and brother of the Ambassador, was made the first president of the Academy. The casts arrived in 1803. The plan of the Academy was similar to that of the Royal Academy of England. It was to have both permanent and periodical exhibitions, lectures, schools, and a library. Among the men connected with this earliest organization was Robert Fulton, a native of Pennsylvania who had been a pupil under Benjamin West.

Unfortunately the scheme was too extensive for a community which at that time had very little appreciation of art, but in 1808 a charter was obtained. At that time Robert R. Livingston, was made president of the Academy and John Trumbull, a portrait and historical painter who had studied under West, was vice-president. Among the directors were DeWitt Clinton, then mayor of New York, and David Hosack, physician, scientist, and professor at Columbia College. During the next eighteen years the Academy had its ups and downs. In 1816 DeWitt Clinton, who had been president, resigned, and John Trumbull took his place. The organization now seemed to be on a sound basis. Famous English artists, members of the Royal Academy, accepted honorary membership in the American Academy. Among them were Henry Raeburn, Thomas Lawrence, Joseph Nollekens, some of whom sent their works to New York for exhibition. But the administration of the Academy was not popular with the younger artists who were coming into prominence. They wanted to be free from the non-professional judgment of stockholders whose authority was due to the money paid for their shares.

Knowing the depth of this feeling and "wishing to reconcile the petty dissensions of the artists," Samuel Finley Breese Morse (1791–1872), who was an artist as well as a scientist, invited a number of them to his room one evening to eat strawberries and cream. Out of the evening's discussion grew a society for mutual improvement in drawing known as the Drawing Association. This was organized in November, 1825. Among its thirty members were Henry Inman, A. B. Durand,

Thomas S. Cummings, William Dunlap, C. C. Ingham, and Thomas Cole. The members met three evenings a week, each member furnishing his own drawing material and sharing the expense of light, fuel, etc. (17—46)

Not long after the organization of the association, Colonel Trumbull, with the stately dignity becoming a gentleman of the Old School, entered the room where the members were drawing, took the president's chair as belonging to him, and with authority asked all present to sign the matriculation book of the American Academy, thus enrolling as students of that institution. This they refused to do, not considering themselves under the Academy's tuition. Great was the indignation expressed, and the suggestion of forming a rival academy was immediately made. The association really desired a union with the Academy, could the artists obtain such a share in the direction of the Academy as they "deemed necessary for the welfare of the institution." (17—46)

Negotiations were entered into between the younger artists and the American Academy but without materially bettering conditions, and on the 19th of January, 1826, the Drawing Association became the National Academy of Design. Samuel F. B. Morse was elected president. It was incorporated on the 5th of April, 1828. (17—49)

Immediately the new Academy held an exhibition of the works of American artists. The second year the exhibition was confined to living American artists and to works not before exhibited by the Academy of Design. The third year none but original works were to be exhibited. (17—51) From the first year also, lectures were given on the fine arts. The first course was presented by the president of the Academy of Design, Samuel F. B. Morse.

The competition between the two academies which continued for years finally resulted in the dissolution of the American Academy of Fine Arts in 1841.

In 1834 the Academy of Design attempted to start a "School of Ornament for industrial art purposes," but the proposition met with no response and the project was abandoned. (17—54) Up to 1849 the Academy of Design had occupied various rooms which were available for its school and its exhibitions. That year it purchased property on Broadway opposite Bond Street, and in 1865 it built the picturesque structure which was its home for many years at the corner of Fourth Avenue

and Twenty-third Street. This was financed by creating a fellowship of men who were not artists but were interested in the promotion of art. Each subscriber who paid $100 became a fellow for life. (17—56)

Meanwhile several other organizations had endeavored to promote interest in art. One of the most active of these, while it lasted, grew out of the efforts of James Herring, a portrait painter, who was at one time the secretary of the American Academy of Fine Arts. The organization started under the name Apollo Association for the Promotion of the Fine Arts, and in 1838 opened a gallery on Broadway. Two years later it was incorporated as the American Art Union. It was essentially an organization to educate the public and to sell American paintings and engravings. The unique feature of the organization and the one which caused its downfall was the fact that every year the pictures on exhibition were publicly distributed by lot. Each member was given a share for every five dollars paid into the treasury. This practice was declared illegal and the Union went out of existence in 1853. (17—57 to 62)

Another organization of about this same period was the New York Gallery of Fine Arts. This was organized to provide a permanent art collection for New York City and was promoted by Luman Reed a successful merchant, whose home on Greenwich Street had been built with the third floor made suitable for a picture gallery. This room became the meeting place of artists and literary men. Among the artists were Thomas Cole, A. B. Durand, and W. S. Mount; among the literary men were James Fennimore Cooper, Washington Irving and William Cullen Bryant. In 1845 the Gallery was incorporated. The organization made a collection of paintings of considerable value but it did not succeed in getting the needed financial support, and in 1858 its collection was turned over to the Historical Society. (17—62 to 67)

In the charter of Cooper Union, founded in 1859, there was a paragraph providing for "the maintenance of a school for the instruction of respectable females in the arts of design, and, in the discretion of the Board of Trustees, to afford to respectable females instruction in such other art or trade as will tend

to furnish them suitable employment." This provision in the charter made it possible for the trustees to take over and develop a school of design for women which had been started the year before by a group of benevolent ladies. (17—72) It was, therefore, the earliest of the important schools of industrial art in New York City.

The climax of the early art development in New York, the founding of the Metropolitan Museum of Art, took place at the very end of the period under consideration in this chapter. The events leading up to it, however, are important. During the years just preceding and those following the Civil War there were evidences that art was becoming a larger factor in the public and private life of the city. An advance in public taste was demonstrated by the popular interest in the picture gallery of the great Metropolitan Sanitary Fair held in 1864 when many of the works of the famous French painters of that time were shown, as well as a larger collection of American paintings. By this time, also, private collections of pictures had "become a new social attraction." More pictures were sold at auction and at much higher prices. Small exhibitions were coming to be more numerous. A group of landscape painters had achieved high reputation. (17—92) Need was felt for an adequate museum and center of art influence. The initial step to bring this about was taken by the Union League Club through the action of its president, the Honorable John Jay. An art commmittee was appointed in October, 1869. As a result of the work of this committee a meeting was called on November 23, 1869, to consider the project. Invitations were sent not only to members of that Union League Club but to members of other clubs, societies, artists, and citizens known to be interested in the development of art in the city. The aim was to make sure that the group brought together should be thoroughly representative. The presiding officer named for the meeting was William Cullen Bryant. This was especially appropriate because he had been intimately connected with the earlier efforts to promote art in New York City and because he "held the confidence, esteem and love both of the artists and the community." Addresses were made by Mr. Bryant, Pro-

fessor George Fiske Comfort of Princeton University, Richard M. Hunt of the American Institute of Architects, Henry G. Stebbins, president of the Central Park Commission, and others. Resolutions were passed favorable to the establishment of an adequate museum of art and to placing the responsibility for further action in the hands of a provisional committee of fifty representative men. On January 31, 1870, permanent officers were elected. John Taylor Johnston was made president. The Legislature of the state granted a charter on the 13th of April and the name given to the body was the Metropolitan Museum of Art. Thus began the many-sided and richly endowed museum of the present day.

96. **Art and Art Instruction in Boston.** Although the present art center of Boston, the Museum of Fine Arts, was not opened until 1876, several years after the period now under consideration, there was continuously for fifty years previous to that time an art gallery in the Boston Athenaeum. Moreover, from an early period there were artists doing creditable work in Boston. Reference has already been made to the work of Smybert who died in 1751. In the year 1737, a few months before the birth of Benjamin West, John Singleton Copley was born in Boston. His parents came from Ireland. He studied under a local painter, Jonathan Blackburn (21—2), gained ideas of color from paintings by Smybert (20–43), but to a very large extent he was self-taught. (21—3) At seventeen years of age he began his career as a painter (20—74) and for the next twenty years he was a portrait painter in Boston. In 1766 he sent a painting of "A Boy with a Flying Squirrel" to Benjamin West in London. "What delicious colouring! worthy of Titian himself," is said to have been West's exclamation as he saw the picture. Contrary to all rules, the picture was hung that year in the exhibition of the Society of Incorporated Artists. This was the beginning of Copley's reputation in England. In 1769 he married the daughter of Richard Clarke, the merchant to whom the tea was consigned that caused the "Boston Tea Party" a few years later. In 1774 Copley sailed for England where he was cordially welcomed by West and Sir Joshua Reynolds and through them and their friends he

was offered commissions in London. However, he carried out his plan, which was to go to Italy for two years to study the works of the old masters. Returning to England, he joined his wife and children in London and remained there, never returning to America. He became noted for his paintings of historical subjects.

Enough has been said in this and previous sections of this chapter to make clear the fact that for the early painters in America as well as in France and England the chief source of inspiration and technique was the study of the works of the old Italian masters. Some went direct to Italy, but more of them went to London. A little later, in the thirties, they went to Paris. George Peter Alexander Healey (1818–1894), the great portrait painter of the Civil War period, studied in Paris. So did William Morris Hunt (1824–1879), painter and popular teacher of art in Boston during the sixties and seventies.

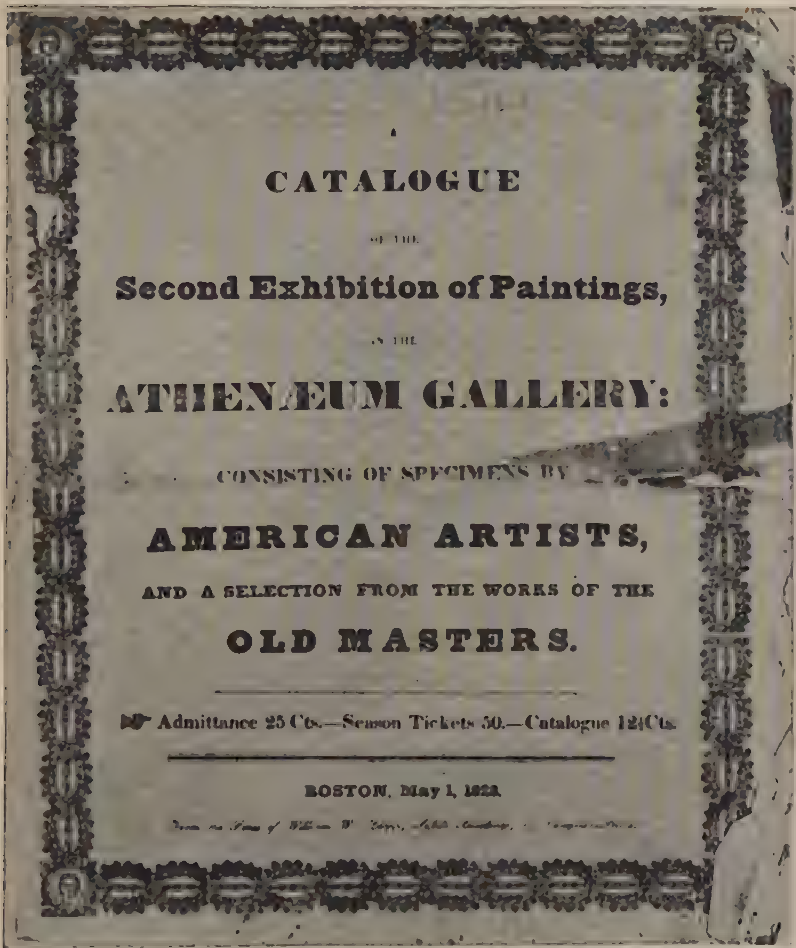
It is an interesting fact that several of the men who exerted great influence upon the art of the early period in America were college-bred. John Trumbull, born in Lebanon, Connecticut, in 1756, graduated at Harvard College before studying with West in London. Washington Allston, a native of South Carolina, born in 1779, was a graduate of Harvard College, before he studied in London and Rome. Samuel F. B. Morse, born in Charlestown, Massachusetts, in 1791, graduated at Yale College just before going to England with Allston to study painting. William Morris Hunt, also, studied at Harvard.

In the year 1804 an association of literary men was formed in Boston known as the Anthology Society. Two years later this society proposed to establish a reading room. Money to further the project was secured by subscription and in April, 1807, the Anthology Society had become the Boston Athenaeum. (22—1) For fifteen years the Athenaeum occupied rooms in Scollay's Building. In 1822 it moved into a newly acquired building in Pearl Street (22—23) which made possible the starting of a museum. With a painting by Stuart and a "collection of casts of the most celebrated statues of antiquity" the museum was begun in 1826. (22—86) By this time Boston was growing as an art center and in order to test public interest

in exhibitions a loan collection under the management of the Athenaeum was opened to the public in May, 1827. It included works of the old masters and several portraits of living persons. The latter, especially, attracted attention. In two months the gross receipts amounted to $4,000. (23—31) The following year a second exhibition was held. The catalogue of this exhibition, Fig. 32, was divided into four parts—I, Old Masters; II, Living Artists; III, Miniatures; IV, "Part of the collection formed by the Late President Jefferson." There were 318 numbered items in the catalogue. A few of the items were starred indicating that they were for sale. Among what were termed "old masters" were several portraits by Copley and one by West. Among those of living artists were several by each of the following painters: Stuart, Sully, Allston, Trumbull, and Raphael Peale, and one by Morse. Thus the Athenaeum became the art exhibition center for Boston. American sculptors as well as painters were represented in these exhibitions and many young American artists first became known through them. Here the famous Audubon engravings of birds were first seen by the public. (23—33) For this gallery the now priceless "unfinished portraits" of George and Martha Washington by Stuart were purchased from the artist's family in 1831 for $1,500. (23—32)

97. **Art Instruction in Other American Cities.** During the early period of American art Charleston, South Carolina, was an important center. As early as 1750 there was a portrait painter in Charleston named Theus. (24—I, 33) In the early part of the nineteenth century Charleston was fortunate in having four artists who became distinguished as painters and were men of high social standing. Edward G. Malbone (1777–1807), a native of Rhode Island, was a successful painter of miniatures. Charles Fraser (1782–1860), a native of Charleston, after practicing law for eleven years, became a very popular miniature painter. (24—II, 151) Washington Allston born in South Carolina, painted a few pictures in Charleston after he graduated at Harvard College and before he studied at the Royal Academy in London. (24—II, 157) Thomas Sully, the famous portrait painter, when a boy attended the

same school in Charleston as Charles Fraser and from him received his first instruction in art and an impulse which determined the course of his life. (24—II, 104)



CATALOGUE

Second Exhibition of Paintings,

ATHENÆUM GALLERY:

CONSISTING OF SPECIMENS BY

AMERICAN ARTISTS,

AND A SELECTION FROM THE WORKS OF THE

OLD MASTERS.

Admittance 25 Cts.—Season Tickets 50.—Catalogue 12½ Cts.

BOSTON, May 1, 1828.

FIG. 32. CATALOGUE OF EXHIBITION OF BOSTON ATHENÆUM, 1828
In Newberry Library, Chicago

Notwithstanding this early development of portrait painting in Charleston no important art school developed there. The young men who wanted to study art went to the larger cities farther north or to Europe or to both.

The city of Cincinnati, very early in its history, became the chief Western center of art and culture. "As early as 1826 Professor Eckstein, a native of Berlin, founded an 'Academy of Fine Arts,' and with the aid of such paintings, studies and sculpture as he could secure, for a number of years gave instruction in drawing and painting." Hiram Powers, the sculptor, was one of his pupils. In 1828, Frederick Franks opened a Gallery of Fine Arts, and among his students were several men who later became well-known painters. In 1835 a second Academy of Fine Arts was organized by a group of young artists. A school of Design which developed into the present Art Academy connected with the Cincinnati Museum was opened in 1869. This school was under the direction of Professor T. S. Noble and was the first established department of the McMicken University, later the University of Cincinnati. After fifteen years this school was transferred to the Cincinnati Museum Association. (25—32, 33)

It is a significant fact that from the opening of the School of Design the art industries—ceramics, metalwork, and textiles—received much attention in the course of instruction. One result has been that Cincinnati has long been known as the home of art industries—the Rookwood Pottery, several large color-printing establishments, and metal-working of various kinds. Another result has been the early training of a group of artists who have been a factor in the development of American painting. Among these was Frank Duveneck.

In the year 1866 a class to work from the human figure was started in Chicago. The next year there grew out of this the Chicago Academy of Design which, except during the year after the Great Fire of 1871, had a continuous development into the Art Institute of the present day. (26—9)

Taking the leading position as an art school connected with a university was the Yale School of Fine Arts, founded by Augustus Russel Street in the year 1864. This school was especially noted because it owned the famous collection of historical paintings and portraits by John Trumbull.

98. **Early Courses in Drawing for General Education.** In the year 1822 John Rubens Smith, teacher in a drawing academy in New York City "designed, executed and published" a remarkable drawing book. The title page of this book reads as follows: "The Juvenile Drawing Book; being the rudiments of the art, explained in a series of easy progressive lessons adapted to the studies and pursuits of young ladies and gentlemen, in all establishments for liberal education: embracing the three departments of art, namely, drawing, shading, and colouring; elucidated in nine books, or three books to each department; comprised in seventy-two copperplate engravings, with copious letter-press instructions." (27—title page)

John Rubens Smith was the son of John Raphael Smith (1752–1812), an English landscape, portrait, and miniature painter and mezzotint engraver. John Rubens Smith is said to have painted portraits in the style of his father and exhibited in the Royal Academy between 1796 and 1811, before he came to America. Smith's drawing book must have represented the most approved method of teaching at that time for in the front of the book is a "recommendatory certificate" which reads as follows:

> We the undersigned, having examined the specimen and plan of J. R. Smith's proposals for publishing a juvenile drawing book, and being acquainted with his principles and method of teaching, of which we highly approve, do readily recommend the above-named book to the attention of those desirous of acquiring correct principles of so elegant and useful an accomplishment.

This is signed by fourteen American artists of that time, fully half of whom had gained national fame. Among them were Gilbert Stuart and Washington Allston, of Boston; Thomas Sully of Philadelphia; and John Trumbull, Rembrandt Peale, and John Vanderlyn, of New York. Below these was a list of patrons including prominent citizens in a still wider range of territory.

The prospectus of the book which is printed on the back cover reveals the fact that at that early period in American education there was at least one writer who had caught the

vision of the wider application of drawing as the language of form and of its value in general education. It reads as follows:

In submitting this Treatise on Drawing, it is to be understood that no pretensions are made to new discoveries in the art, or to exhibit superior patterns to my predecessors. The system is predicated on the ground that the *principles of drawing* ought to form an integral branch of liberal education; and though it is not expected that every one who learns to read will, therefore, become a poet or author; or that, by learning to write, they must, consequently, become chirographists,—any more than by learning to draw they must become artists or painters; yet no one, it is presumed, will deny the important connexion this art has with every pursuit in search of knowledge, and the sources of civilisation. What is architecture, naval, civil and military—the cabinet-maker, machinist, and manufacturer—every branch of natural history, that wide field of creation—and every scientific research, historical, political, and medical—without this all-important universal language?

The object of this undertaking is to introduce the simple elementary principles into schools, in a manner that, while it combines with their other studies, imperceptibly imparts the power to execute whatever genius and taste may hereafter be induced to undertake. Each principle will be accompanied with examples of its application, and letter-press explanation of the mode of setting about it, and its process, until finished. Many excellent drawing books, extant, are replete with good examples, sometimes accompanied with a description of the view, and even pointing out what *ought to be done*, but rarely do we meet with an instance of their instruction *how to do it*. This system will explain the principles, and the process how to execute them, as far as can be developed by language and twenty-five years' experience. It commences with mathematical forms, ever to be found in all drawings: such as squares, curves, triangles, etc., applicable to windows, doors, furniture, in short, every object in art and architecture, with perspective inclinations of buildings, arches, bridges, instruments of agriculture, war, etc., analysis of foliage, character of trees and flowers, fancy and ornamental subjects, etc., etc., executed in pencil and chalk, on easy, simple principles of shading, comprised in three books: from which a tolerable facility of delineating being acquired, the pupil is then led to the use of the camel's hair pencil, by exercises, to acquire the method of washing in India ink, the requisite tints and shades, with easy examples, on the principles before exhibited, only varied in objects, so as to enliven the study, and develope further improvement, in three books. When a facility in using a camel's hair pencil is thus acquired, it is applied to colours; the principles of which, and the method of compounding them, are explained, in three other books, on suitable subjects, embracing a variety of objects calculated to amuse and instruct young minds.

To each department will hereafter be added supplementary numbers as occasion may require, not with a view to multiply patterns, and increase expense, but by selecting a striking example, to explain thereby *how* to make use of the many fine patterns now extant.

Should this work meet with suitable encouragement, it is in contemplation to extend its operative principles into the classical and elaborate branches of

the art, calculated both for amateurs and students in the profession, with such other illustrations as the pursuit may give rise to in supplementary numbers. (27—back cover)

No evidence is available that more than the first book was ever issued. It must have been quite expensive to produce; the copperplates were large and well executed, and the book was printed on pages 10½ in. by 16¼ in. and on one side of the paper only; it was bound in boards covered with paper, and with leather back and corners. It was sold by subscription.

There seems to be little doubt that this book fairly represents the best thought of the time among the teachers who were themselves trained professional artists. Smith's training and experience before writing the book, as well as the evidence in the book itself, would lead to this conclusion. Whether Smith was acquainted with the theory and experiments of Pestalozzi and Buss (cf. 35) is not known to the writer, but it is certain that Pestalozzi's work was known in both England and America before 1822. The book would seem to be the work of an artist-teacher, who had heard something of the "alphabet of form" by Pestalozzi and caught the viewpoint of Buss who said that he had "learned the art" but was "ignorant of the basis on which it rested." (Source Material IV, A) Smith sought to make learning to draw a more rational process. He recognized the value of beginning with geometric forms, but he did not stop there; he extended his analysis of form to the study of trees and many common objects and sought continually to emphasize the application of principles. The above statement is borne out by the following paragraph from Smith's introduction:

On inspecting this book, you will no doubt feel some disappointment at not finding pretty little landscapes and gaudy flowers, as has hitherto been the fashion: but have patience; copy what is here set down, which may be considered as the *alphabet* of the art, and you will soon be gratified with as many pleasing objects as you may wish, besides being enabled hereby to execute them with more ease and satisfaction than by any other method you can hope to accomplish. (27—6)

The exercises of Plate I include the drawing of circles, ovals and large arcs very freely. Then comes the drawing of horizon-

tal and vertical lines and lines at the more commonly used angles of intersection. Proper holding of the pencil and free movement are emphasized. Plate II begins with drawing parallel lines and the division of lines into a given number of equal parts. The drawing of angles is developed into the drawing of squares and oblongs, and parallel lines into cross hatching or shading or "scumbling," as it is called by the author. In Plate III rectangles and scumbling are applied to windows and doors in perspective, with tints and shadows,—some of the windows with diamond panes. Elements of stone construction —corners, lintels, etc.—are shown in perspective in Plate IV. In Plate V triangles representing various roof pitches are developed in a simple building in perspective and into arches. (Fig. 33) The next three plates give various applications of these in buildings and bridges. In all these problems the geometric basis is emphasized. Beginning with Plate IX are four plates dealing with the study of foliage and the trunks of trees. This begins with the various groupings of leaves in nature, Fig. 34, and follows with a study of the growth of tree branches. Plates XIII and XIV show applications of the ellipse in drawing a variety of common objects in perspective. (Fig 35) These objects begin with simple glasses and mugs and end with cannon. One plate is given to the drawing of animals, Fig. 36, and one to the human figure. Plates XVIII to XXI inclusive show ways of combining the various elements learned—buildings, bridges, common objects, foliage, and animals—into pictures. The last three plates give combinations of rocks, foliage, and water, in making landscape studies. Each plate is lettered for reference and opposite each is a full page of carefully worded directions for students.

This statement of the contents of Smith's first book on delineation is given to emphasize the fact that copying was the almost universal method of learning elementary drawing at that time and that what characterized the work of Smith and those who agreed with him was not to do away with copying but to make copying more intelligent. Just as the leading painters went to Italy to copy the old masters, so the beginners went to the drawing books for worthy examples to copy, but

FIG. 33. PLATE V. FROM *Smith's Juvenile Drawing Book*, 1822 Size 10½"x16½"

FIG. 34. PLATE XI. FROM *Smith's Juvenile Drawing Book*, 1822

FIG. 35. PLATE XIII. FROM *Smith's Juvenile Drawing Book*, 1822

FIG. 36. PLATE XV. FROM *Smith's Juvenile Drawing Book*, 1822 Size 11½"x16½"

the beginner needed more than the drawing to copy; he needed instruction, an understanding of basic principles and when and how to apply them. Smith's book was an effort to accomplish this, and to do it in a way to make drawing a more valuable factor in general education.

Concerning equipment for drawing Smith says in his introduction:

> In schools where accommodations are required for many, it would be adviseable to have a board, eight or nine inches wide, running like a shelf along one or more sides of the room, resting on the moulding of the dado, or hinged to the wall like a fall-down dresser, with a fillet on the outer edge, to retain the pencils, etc. Each scholar should then be provided with a light pine board, about three-quarters of an inch thick, from twenty to twenty-four inches wide, and from two to three feet long, clapped at each end, and at one end, which serves for the bottom, there should be a raised edge, like that of a counting-house desk, to keep papers from sliding off; this board then rests, one end in your lap, the other against the shelf or bar in front, as the case may be, at an angle of about fourty-five degrees, varying at pleasure, according to what part of the work you are upon. Students in all public schools in Europe draw with this board against a bar, which experience has proved to be the most commodious way, as the inclined lines are made with more ease by moving the board from side to side with your left hand. But in ink and colours, as you require your left hand at liberty, a slanting desk, moveable at pleasure, like a music desk, and lying on a flat table, which admits room for the colours and materials, around it is most convenient. (27—6)

Special attention has already been called to the teaching of drawing in Bronson Alcott's school in Boston, 1834 to 1839, (cf. 54) and its superiority over that taught under Pestalozzi. Francis Graeter, the teacher in Alcott's school, required his pupils to go direct to nature for most of their models. They would draw from a plant growing in a flower-pot instead of from some artist's drawing of it. In this respect Graeter's work was far in advance of Smith's. His methods were much more like those developed twenty years later at the Workingmen's College in London by John Ruskin and published in his *Elements of Drawing* in 1857. (cf. 81)

99. **Drawing in Boston Public Schools Before 1870.** Boston was the pioneer among American cities in giving instruction in drawing to pupils of the public schools. It came about in this way: The master of a large boys' school, run on the moni-

torial plan, was suddenly taken sick and there was no fit person available to take his place. To help out in the emergency William Bently Fowle (1795–1865) a member of the Boston School Committee, volunteered to take charge of the school. This was in the year 1821. The master died and Fowle remained in the school. He was so successful that he made teaching his life work. "Original, enthusiastic, and able," he brought about many changes in his school and one of these was the teaching of drawing as an integral part of school work. (11—I, 5)

He introduced blackboards and the daily drawing of maps on the blackboards and on slates and on paper by pupils taking geography. "Linear drawing in its simplest application to geometrical figures, especially, was made a regular exercise." (11—I, 5) In 1827 Fowle obtained a copy of a book on drawing by Louis Benjamin Francoeur that had just been published in France. This book was the result of an order issued by Napoleon to the Bureau of Instruction to prepare a drawing book for the national schools of France, and was entitled *L'enseignement du dessin linéaire.* (28—3) Fowle translated it immediately and published it under the title *The Eye and Hand.* It is essentially a book to teach the drawing of geometric figures, geometric solids, a few architectural elements, and such objects as urns, bowls, pitchers, and cruets in profile. The problems are numbered and given in a manner similar to propositions in geometry but they are supposed to be arranged in the order of difficulty in drawing. The course is confined to line drawings; shading is not taught. At the end of each chapter or division of the book is a group of questions on the chapter. In the preface, third edition, 1830, the translator says:

> Each figure is accompanied with suitable explanations, so that the teacher or monitor will easily comprehend them, and be able to teach them to his classes without much previous acquaintance with the art.
>
> The pupils are each furnished with a slate and pencil. The monitor directs what figure shall be drawn, and if the pupils are not all furnished with this treatise, he chalks the figure on a board painted black for the purpose, and suspended where all can see it. The slates are then examined by the monitor, and precedence is given to whichever pupil has executed the figure best.
>
> The children should not be permitted to draw on paper until they have become thoroughly acquainted with the figures of the five first classes.

[These classes were: 1, Right lines; 2, Polygons and solids; 3, Circles; 4, Cylinders and cones; and 5, Mouldings.] Pupils are not to be allowed the use of a rule or any other instrument; but the monitor, to correct and prove their figures, may be furnished with a rule, dividers, square, and protractor or graduated semicircle.

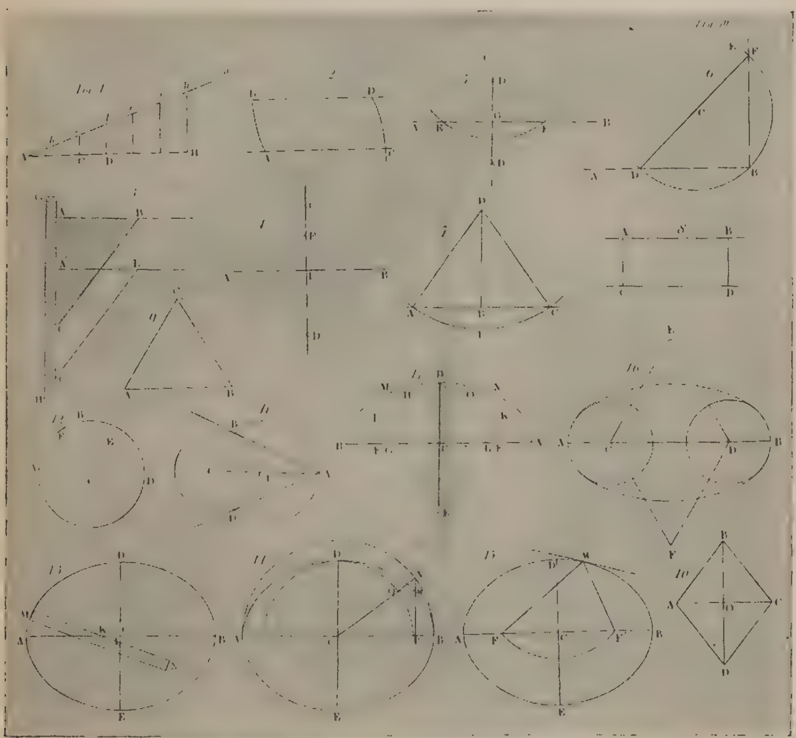


Fig. 37. Course in Geometric Drawing
From *The Eye and Hand* by William B. Fowle

One of the aims of Fowle was to teach mechanical perspective. Evidently his early experience with his book taught him that the freehand drawing of geometric figures was not an adequate preparation for perspective, for in his third edition he adds an appendix which gives directions for drawing with instruments many of the geometric figures previously drawn freehand. The plate accompanying this appendix, Fig. 37, appears to be the earliest course in instrumental or mechanical

drawing taught in an American public elementary school. The character of the course in perspective which followed the geometric drawing with instruments is suggested in Fig. 38.

In teaching the drawing of geometric figures with instruments Fowle calls attention to the fact that Francoeur urges

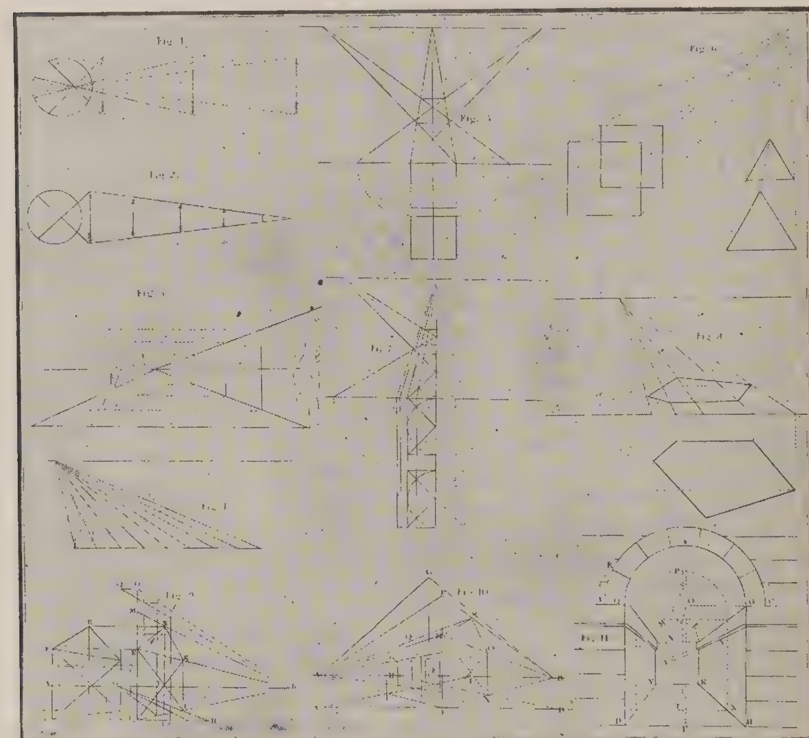


FIG. 38. PLATE ILLUSTRATING PRINCIPLES OF PERSPECTIVE FROM *The Hand and Eye* BY WILLIAM B. FOWLE

the "necessity of teaching by example; that is, of drawing and explaining the operation before the eyes of the pupils, and then adds as testimony his own belief that no other mode of instruction can be made so effectual." Then he adds, "It benefits the teacher as much as the pupil. After a few examples, the pupil can go on alone." (28—52)

In this instrumental drawing the instruments used were the rule, the square, and dividers. (28—53)

Two paragraphs in the preface to the 1847 edition of Fowle's book give added proof of the teaching problems he was trying to solve and of his open-mindedness. He says, "Directions are given at every step, so that the teacher who knows nothing of drawing, may, by following the rules, learn the art while teaching it." (28—4) In another paragraph he says that he "would not exclude fancy drawing, because this cultivates the taste as well as the eye and the hand." He would "introduce fancy figures occasionally," to "vary the exercise and give life to it," but he could see no system in that kind of drawing and therefore it had little value. He believed that pupils who had completed the first part of his book would be able to apply the knowledge gained to the drawing of natural objects. Fowle's chief contribution was in adapting the teaching of linear drawing—chiefly geometric drawing—to the conditions of that time in public schools.

In the same year that Fowle obtained and translated Francoeur's book, 1827, drawing was made a permissive study in the English High School in Boston. In 1836 it was made obligatory though no special teacher was provided to teach the subject until 1853. It therefore received but little attention before that date. (11—I, 234)

Out from Bronson Alcott's (cf. 54) School went a strong influence favorable to the teaching of drawing and the appropriate decoration of schoolrooms. (Fig. 39). Elizabeth Palmer Peabody, one of Alcott's assistants, gave gratuitous instruction in drawing to a class of 50 children in the Franklin School, Boston, during the winter of 1838–39. The methods employed were set forth by Miss Peabody in a book entitled *A Method of Teaching Linear Drawing.* In order to promote instruction in drawing, in 1841–42, she gave a course for teachers in the primary schools. There were nearly 100 in this class. A sister of Elizabeth Peabody, Mary T. Peabody, who later became Mrs. Horace Mann, prepared a book of exercises correlating reading and drawing. This was entitled *The Primer of Reading and Drawing.* (11—I, 13)

In 1842 Josiah Holbrook, leader of the Lyceum Movement (cf. 83) prepared a series of 36 drawing cards to assist teachers

Fig. 39. Interior View of Bronson Alcott's Schoolroom in Boston
From *Record of Mr. Alcott's School* by Elizabeth P. Peabody

in giving instruction in drawing on slates or blackboard. (11—I, 12) About this same time Henry Barnard (1811–1900), who later became distinguished as the first United States Commissioner of Education, was publishing from time to time in the *Connecticut Common School Journal* articles on the value of drawing and on courses of instruction and methods of teaching drawing. In 1843, Horace Mann (1796–1859), then secretary of the Board of Education in Massachusetts, made his famous "seventh annual report" on his observations while visiting the schools of Europe, especially those in Prussia. In this report, which became the basis of school reform in Massachusetts, the value of drawing was given considerable emphasis. (Source Material XI, A) As one of the results of this report the School Committee of Boston, in 1848, placed drawing in the list of grammar school studies, but as no provision was made for teaching the subject "either in the way of a program, textbooks or special teachers, next to nothing came of this action. The prevailing ignorance in regard to the subject was only equalled by the indifference respecting it. If a progressive teacher tried to get up a little drawing in his school, he was likely to get for his pains a gentle rebuke from his committee, and some blame from his fellow teachers." (11—I, 234)

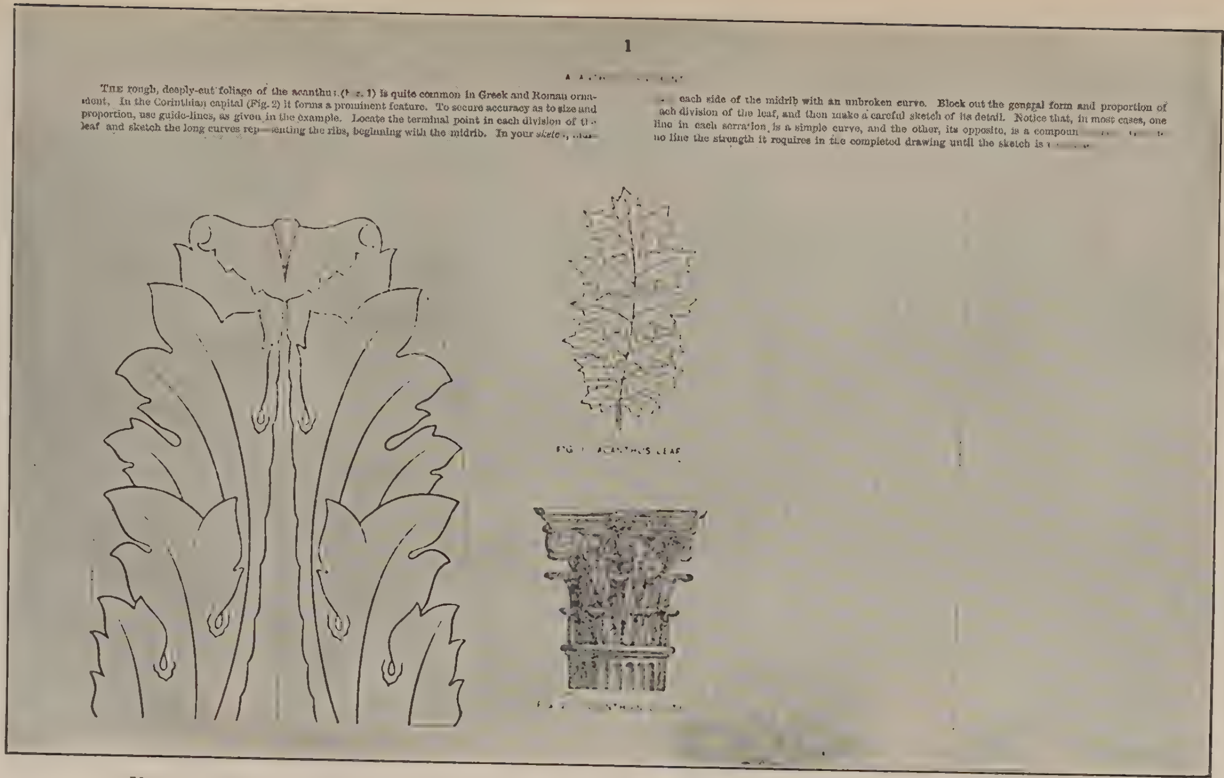
The credit for changing these conditions was largely due to the continued efforts of John Dudley Philbrick (1818–1886), who was superintendent of schools in Boston for eighteen years, 1856 to 1874, during which time the state of Massachusetts and the city of Boston became widely known for their leadership in art education in public schools.

One of Mr. Philbrick's first acts was to procure from the English Government "a lot of drawing copies, models, and books." Then he prepared drawing slates and tablets for use in the primary schools.

He was assisted in this by William Newton Bartholomew (1822–1907), who had been the special drawing teacher in the Girls' High and Normal School since its establishment in 1853, and who had already worked out a series of drawing lessons for use in the grammar grades. Mr. Bartholomew was a native of Boston who became a cabinet maker at Post Mills,

Vermont, and later went back to Boston to study art. In 1864 drawing was made a required study in the Boston schools. By 1868 a complete graded system was in use, beginning in the primary grades with Mr. Philbrick's slates and tablets, followed by Mr. Bartholomew's drawing books in the grammar grades, and ending in the high and normal school with instruction under special teachers. Bartholomew's books covered freehand drawing in outline, geometric drawing, model and object drawing and perspective. To help the teachers in the grammar grades Bartholomew "held voluntary meetings in different parts of the city for the purpose of illustrating his method of teaching." (11—I, 235)

Concerning the methods and the course of instruction used by Bartholomew it should be pointed out that his aim was to help the pupils to gain practical knowledge and skill in the art of representation, not merely to give ability to copy. He insisted that the pupils should draw objects as well as make copies of the drawings shown in his books. After the examples given in his book had been drawn, some similar object should be selected and the pupil should be required to draw it. He considered this indispensable. "If this cannot be done in the schoolroom," he said, "let it be done at home; and let the drawings made be brought to school for criticism." (29—6) He recommended that drawing from memory be frequently practiced. (29—5) To a limited extent he kept in mind the industrial aims of drawing though his major interest was in representation drawing and painting. He was himself a painter who exhibited annually in Boston. In the teaching of ornament, in so far as it was practicable, he would have the student become acquainted with (1) the natural form, (2) the conventional form, and (3) the practical application. A page from Book No. 6 in his "National System," shown in Fig. 40, and another from the Teachers' Handbook, Fig. 41, illustrate this idea. Bartholomew was clearly an expert in pencil drawing of outdoor subjects. In his advanced drawing books and in several groups of separate plates that were published there were such drawings as those shown in Figs. 42, 43, 44, 45, and 46. These would seem to be the lineal descendants of some of the plates



1

THE rough, deeply-cut foliage of the acanthus (Fig. 1) is quite common in Greek and Roman ornament. In the Corinthian capital (Fig. 2) it forms a prominent feature. To secure accuracy as to size and proportion, use guide-lines, as given in the example. Locate the terminal point in each division of the leaf and sketch the long curves representing the ribs, beginning with the midrib. In your sketch, [illegible] each side of the midrib with an unbroken curve. Block out the general form and proportion of each division of the leaf, and then make a careful sketch of its detail. Notice that, in most cases, one line in each serration is a simple curve, and the other, its opposite, is a compoun[illegible] no line the strength it requires in the completed drawing until the sketch is [illegible]

FIG. 1. ACANTHUS LEAF

Fig. 40. Plate in Bartholomew's National System of Industrial Drawing, Book 6

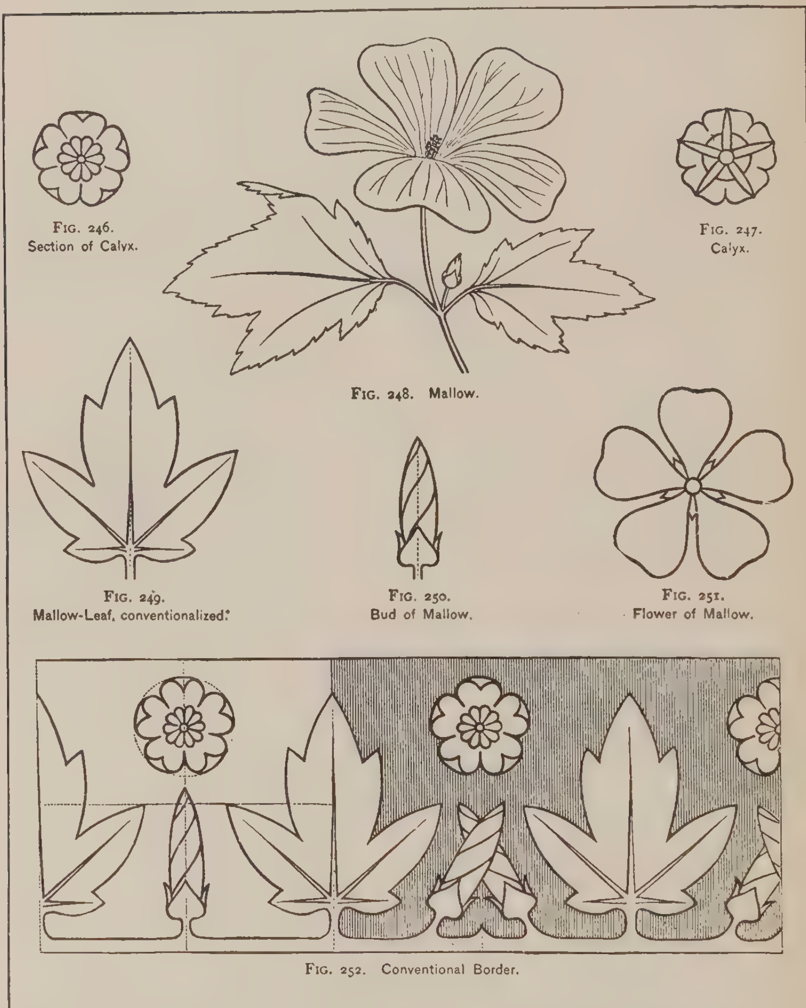


FIG. 41. A PAGE IN TEACHERS' HAND BOOK NUMBER 2, BARTHOLOMEW'S *National System of Industrial Drawing*

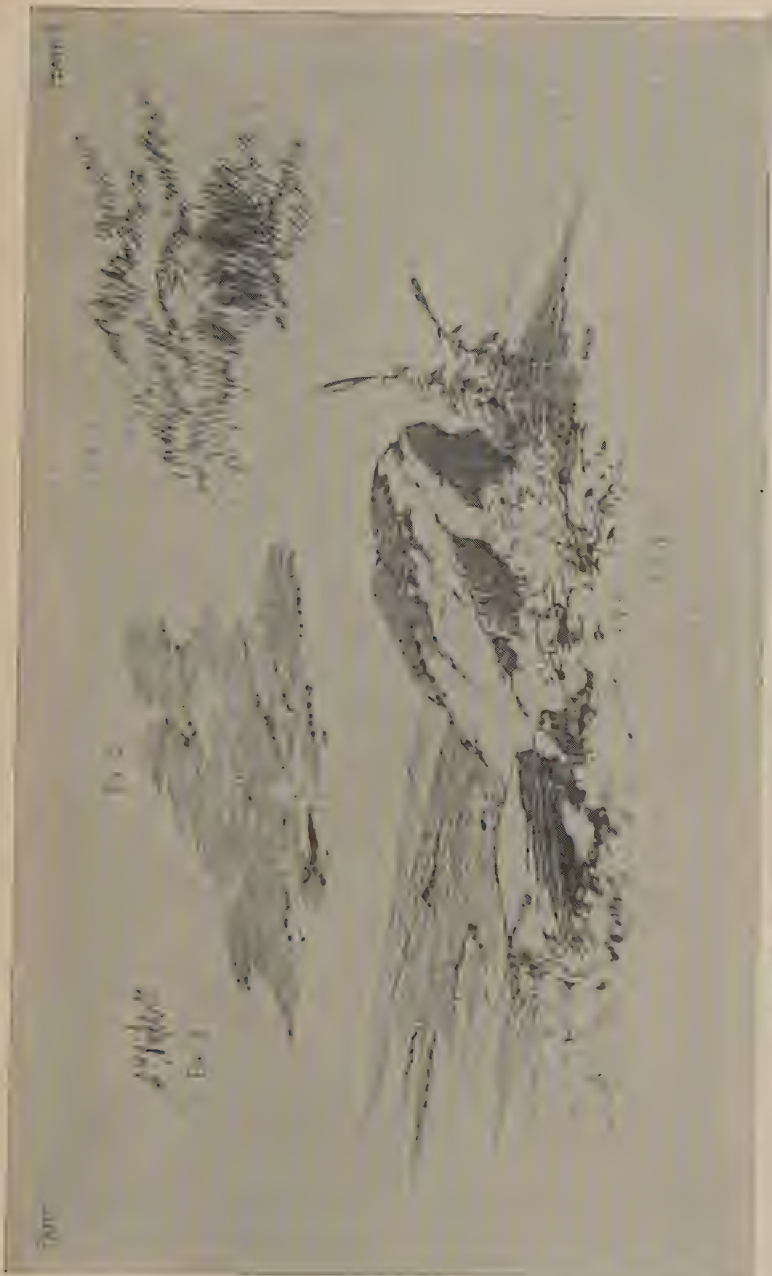


Fig. 42. Study of the Elements of Landscape, by Bartholomew Size 6¼″ x11″

Fig. 43. Outdoor Study by Bartholomew Size 6¼″x11″

FIG. 44. LANDSCAPE STUDY BY BARTHOLOMEW Size $6\frac{1}{4}'' \times 11''$

Size 6¼"x11"

Fig. 45. Landscape Study by Bartholomew

Fig. 46. Landscape Study by Bartholomew Size 6⅛″×11″

in Nathaniel Wittock's *Oxford Drawing Book*, a revised edition of which was published in New York in 1847, and to have a family resemblance to those in *The Early Drawing-Book* by J. D. Harding, published in London, the drawings for which were made in 1854 and 1855, though Bartholomew's handling was much freer. These plates seem to have cultivated a taste for pencil sketches of cubical boat houses, fish houses, poultry houses, small cottages and gates, boats, lobster cages, rocks, trees, roads, and bits of the Atlantic Ocean that have been characteristic of New England school art ever since that time and have found finer expression in the works of some of the noted artists who have worked along the New England coast.

But the type of drawing represented by the Bartholomew books did not satisfy the demands of the time which were for more drawing that would have immediate effect upon the industries of state. Massachusetts was developing its industries, and the manufacturers were asking the schools to do more to help in the training of industrial workers. More technical education was demanded, and an important part of this was instruction in industrial, which was chiefly mechanical, drawing. While the way was not yet open for instruction in the mechanical crafts and trades in the public schools the teaching of drawing did seem practicable. Moreover, at that time, the chief argument for the teaching of drawing in the public schools was its industrial utility value and not its cultural value. It was this argument that caused the legislature of Massachusetts, in 1870, to pass the following act:

Section 1. The first section of Chapter 38 of the general statutes is hereby amended so as to include drawing among the branches of learning which are by said section required to be taught in the public schools.

Section 2. Any city or town may, and every city or town having more than 10,000 inhabitants shall, annually make provision for giving free instruction in industrial or mechanical drawing to persons over fifteen years of age, either in day or evening schools, under the direction of the school committee.

Section 3. This act shall take effect upon its passage.

Approved May 18, 1870. (11—I, 40)

The passage of this act was followed by marked interest in the teaching of drawing. The city of Boston immediately made provision for an evening drawing school which was opened

in November in the large drawing rooms of the Massachusetts Institute of Technology.

Nearly 1,000 applicants, male and female, entered their names upon the register; upwards of 500 pupils received instruction for a longer or shorter period, not more than 225 being accommodated in the rooms at one time; the school was open four nights a week, the pupils divided into two sets, attending in turn two nights a week. . . . Ten different instructors were employed, most of whom were connected with the Institute of Technology, either as teachers or pupils. Instruction was given in general freehand drawing, in freehand drawing of machines from solid models, in mechanical drawing and architectural drawing, and in ship-drafting.

The school was altogether a success. The pupils, a majority of whom were young mechanics, found they were getting what would be of the greatest use to them, and so they attended punctually and worked with a will. (11—I, 220)

To insure the intended results from the law of 1870 it became apparent that a trained and experienced director of drawing was needed. As there seemed to be no one in this country qualified for such an important task the leaders in the movement looked to England for help. The result was that Walter Smith, a graduate of the school at South Kensington and headmaster of the government school at Leeds, was employed jointly by the state of Massachusetts and the city of Boston. This act was the initial step in the rapid development of art education in American public schools which took place during the twenty years that followed. (11—I, 226)

100. **Early Efforts to Establish Drawing in Public Schools of Philadelphia and Baltimore.** The early experiences of teachers of drawing in Philadelphia and Baltimore emphasize the fact that during the period now under consideration the true place of drawing in public education was seldom understood and that opposition to its teaching often came from school officials.

As has been stated in another section (cf. 94), Philadelphia led all the other cities of the country in the development of the fine arts of painting and sculpture, but it failed to take the lead that was open to it in giving drawing instruction in its public schools. Rembrandt Peale, the celebrated painter in Philadelphia, had two major ambitions in life: One was to paint a worthy portrait of George Washington and the other

was to inaugurate a system of teaching drawing in public schools which should be "as cheap, as elementary, and as common as reading and writing." In order to carry out his second purpose, in January, 1840, he secured a position to teach drawing three days a week in the Philadelphia high school. The good work done by his pupils was a surprise to many who visited the school. He prepared a book setting forth his method which was entitled *Graphics*. Having given his method a trial for two years in the high school, Peale offered to superintend without charge the introduction of his system into the grades below the high school. (11—I, 15) His offer, however, met with serious opposition on the part of some members of the school board. "Their idea of drawing evidently was either that of the fashionable boarding school or that of the scientific engineer, something for advanced pupils only, something elaborate and costly, belonging to the highest order of schools, not to the primary school." (11—I, 15) A committee of manufacturers, engineers, artists, and educators made an investigation of Peale's system for the school authorities and gave it their hearty approval. One of the committee, a graduate of the Imperial Academy of Engineers in Vienna, said that Peale's system was very similar to those employed in Austria, Germany, and Italy. It was therefore adopted, but not unanimously. The opposition of the minority was so persistent and annoying that after a few months Peale gave up his project in despair. Finally he resigned from his position in the high school which he left in July, 1844. His system of teaching, however, was long continued in that school with satisfactory results. (11—I, 15)

Two of the important features of his system were: (1) that each pupil was first to work from copies and then to draw from nature, (2) that he should learn freehand drawing before mechanical. (11—I, 16) He believed that the early training of eye and hand was of great value as a preparation for any kind of mechanical pursuit. He placed special emphasis on pencil drawing.

In Baltimore, in the year 1845, the report of the public school commissioners stated that "a knowledge of drawing being

important to persons of almost every situation of life, it was deemed advisable to introduce it as a branch of study into the high school and Mr. William Minifie, an architect of acknowledged ability, was engaged to give lessons in that department." He continued in this position for three years. Mr. Minifie was the author of *A Textbook of Geometrical Drawing*. This book, published in 1849, by D. Van Nostrand and Company, was very comprehensive and was for many years the standard American text-book on the subject. It is said to have been used in England at the Government School in South Kensington. The book contained fifty-six full-page steel engravings accompanied by explanatory text. It began with definitions. These were followed by a variety of geometric problems, including the construction of geometric figures. Then came sections of solids and several plates of developments. There were plates showing designs for arches, a cottage, and drawings of gear wheels, and the cylinder of a locomotive. Finally isometric drawing, mechanical perspective, shades and shadows, and coloring were treated. Figs. 47 and 48 illustrate the character of the plates.

101. **The Beginnings of Public School Drawing in Ohio.** Attention has already been called to the fact that as early as 1838 Calvin Stowe made a report to the Ohio legislature on the schools of Europe in which he gave some prominence to instruction in drawing. (cf. 62) For this reason and in consideration of the fact that there were, in southern Ohio, many Germans who were highly skilled craftsmen, Cincinnati became one of the foremost cities of the entire nation in making drawing a definite subject of instruction in public schools. In the year 1842–43, according to the report of the president of the School Board, successful experiments in teaching the "very useful art of design" were made in some of the districts of the city.[1]

In 1846 the president's report refers to map drawing on the blackboard and to the fact that drawing is used to illustrate

[1]For this and other information concerning the early teaching of drawing in Cincinnati the author is indebted to William H. Vogel, the present director of art in the public schools of Cincinnati, who took the trouble to look up the records in school reports.

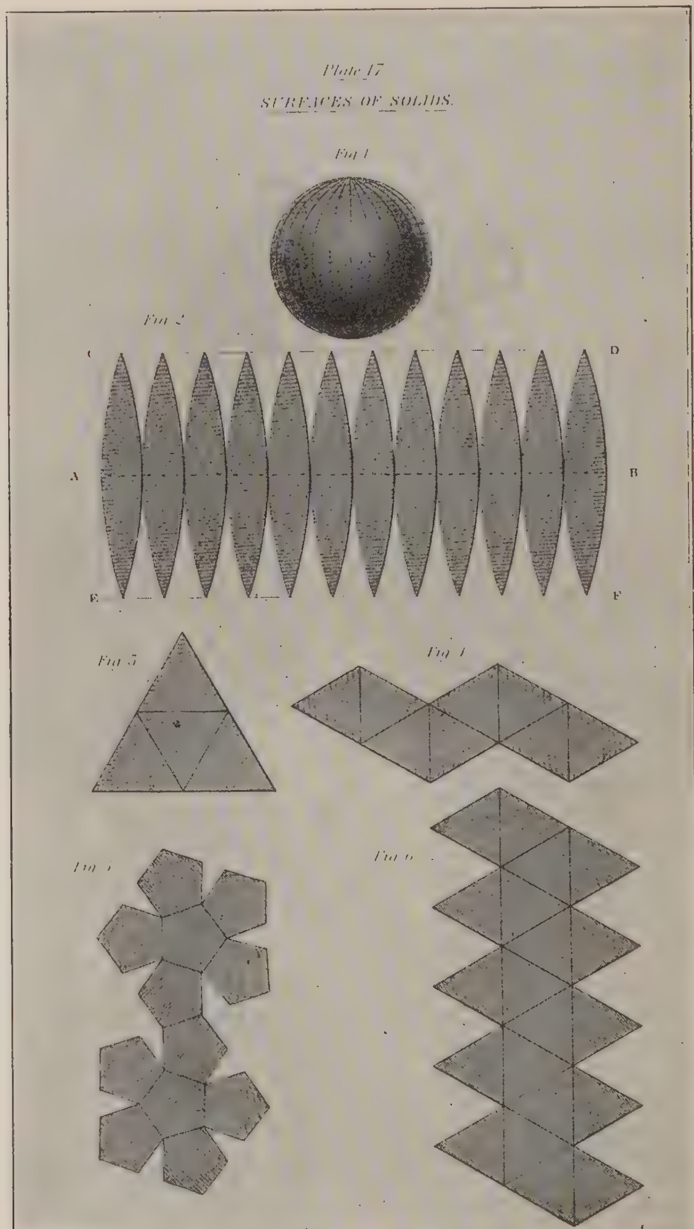


FIG. 47. DEVELOPMENT OF SOLIDS. FROM *Textbook of Geometrical Drawing* BY WILLIAM MINIFIE

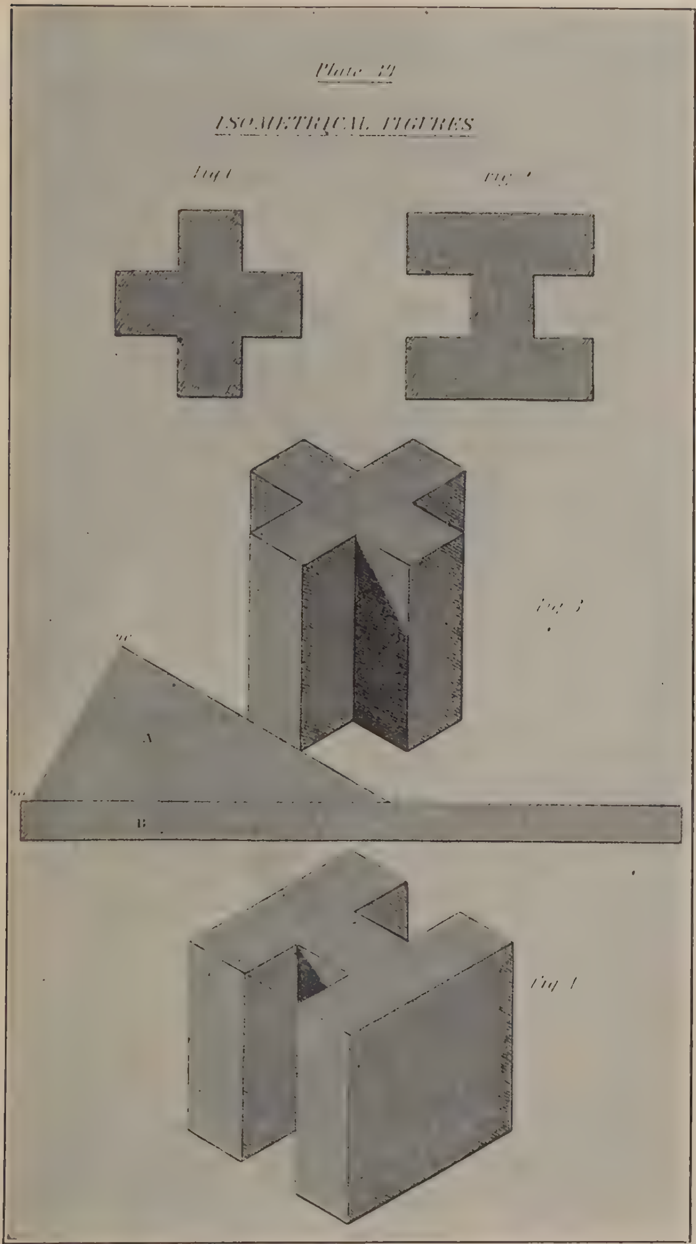


FIG. 48. ISOMETRIC DRAWING ILLUSTRATED. FROM *Textbook of Geometrical Drawing* BY WILLIAM MINIFIE

some of the higher branches of instruction. In the same year J. W. Bowers was appointed to supervise the teaching of penmanship and to give instruction in drawing. He seems to have been the first regularly appointed teacher of drawing in the Cincinnati public schools. The report further states that "under direction of Mr. Bowers, supervisor of penmanship, linear and perspective drawing, as well as maps, were beautifully elineated." Among the subjects listed in 1847 were drawing from patterns, drawing from solid objects, linear perspective, and shades and shadows. The first use of the title "Drawing Department" as a separate part of the school organization is noticed in the report of 1847–48 with W. B. Shattuck as the teacher in charge. His teaching was done in the Central School which corresponded to the present high school. It is interesting to notice that the work of Mr. Shattuck began four years before that of Mr. Bartholomew who was the first teacher of drawing in the high schools of Boston.

Further evidence of the progressive attitude toward drawing by the school authorities of Cincinnati is found in the fact that in that same year, 1847, the "elements of drawing" were included in the course of study for grades three to six inclusive. For the seventh grade linear drawing is designated, for the eighth perspective, and for the ninth shades and shadows. By 1851, perhaps earlier, the children in the primary grades were furnished with slates and pencils and encouraged to draw from copies, on the ground that "it not only occupies and amuses their idle hours, and keeps them still, but gives them the use of the thumb and finger, and habitudes of sketching and drawing which are afterwards serviceable to them in learning to write."

In 1863 the course for the upper grades was outlined as follows:

> Grade E.[1]—They shall be taught to draw vertical and horizontal lines; the square, the rectangle, and figures composed of squares and rectangles. A few examples are to be given, and then the pupils are to be encouraged to build up designs of their own, as they would with blocks.
>
> Grade D.—They shall be taught to draw oblique lines, and figures composed of squares, parallelograms, triangles, etc., the pupils being encouraged to originate designs. They should also now begin to draw objects in outline.

[1]Grades E, D, C, B, A corresponded to the present grades 4, 5, 6, 7, 8.

Grade C.—They shall be taught to draw cubes, rectangular solids, curved lines and objects, first in outline and then shaded.

Grade B.—They shall be taught to draw ten different simple mechanical implements, the leaves of ten different kinds of forest trees, and the outlines of ten different maps.

Grade A.—They shall be taught to draw ten different articles of household furniture, or mechanical implements; ten maps, with parallels and meridians; a ground plan of their schoolroom, showing the location of the various articles it contains; and ten miscellaneous objects, selected by the teacher.

In 1865 the "Bartholomew Drawing Books and twelve cards of human figures and animals" were adopted for use in the schools. Two special teachers of drawing were employed in 1866. The report of the superintendent of schools in 1867 states that astonishing results had been obtained; a great amount of talent had been found to exist among the pupils; some had secured employment solely on the ground of their proficiency in drawing. He then adds, "If the progress in this department continues as it has for the past year or two, we may justly feel proud of this part of common school instruction." Lessons in drawing were given twice each week in the two upper grammar grades.

In 1868 drawing was made a required subject of instruction in all of the schools and a supervisor, Arthur Forbriger was employed who reorganized this department of instruction. According to the superintendent's report of that year Cincinnati was the first city in the nation to undertake such an "experiment." "In realizing our anticipations in this," he said, "we shall do much to elevate the character and tastes of our whole people. But to lay the foundations of artistic tastes merely—to stop with the rudiments—is not sufficient. We need the means of further culture. The development of whatever of artistic genius there may be in our community will not only add to the sum of civilization and refinement in our city, but will add to its material wealth as a great manufacturing center."

Mr. Forbriger's plan of giving instruction is indicated by the following statement from the superintendent's report of 1869:

The drawing teachers give lessons in the A B and C grades of the district schools. The three lower grades are taught by the regular teachers, who are themselves taught by Mr. Forbriger—the schools of each grade, in accordance

with a resolution of the Board, being dismissed once a month, on Friday afternoon, at recess, to permit the teachers to gather at some convenient school house for the purpose of receiving such instruction. In these meetings the work of the schools for the month, in the respective grades, is laid out and explained. The teachers, with due attention to these lessons, and a proper determination to meet the requirements of the Board, will find no great difficulty in transferring to their pupils the instruction they have themselves received at these meetings and the ease and efficiency with which they can do so will constantly grow with practice.

The supervisor gave "regular lessons two days in the week" and devoted the remainder of his time to supervision.

In 1868 there was published in Cincinnati a series of drawing books which had been prepared by Robert Demcker, a teacher of German in that city. The title given to the series was *Course of Systematic and Progressive Drawing.* It consisted of six books and a teacher's manual. The early part of the course was mathematical, following the plan of Pestalozzi and Froebel. Later in the course the drawing was arranged with reference to its connection with other branches of instruction, as mathematics, architecture, botany, geography, natural history, penmanship, etc. The methods employed involved drill exercises on parts, as, for example, in drawing flowers the pupil was taught to draw leaves first, then blossoms, and so on. In drawing animals he began by studying the head and then the feet.

These books were introduced into the schools but they did not meet with the approval of the supervisor. Later Mr. Forbriger himself prepared a series of drawing pads which were used for a number of years. Each exercise when completed was torn off the pad and filed away in an envelope, thus keeping it clean.

As early as 1849 the annual report of the Board of Managers of the Cleveland public schools referred to the fact that "accomplished extra teachers" were employed to teach drawing in Cincinnati and stated that in Cleveland about one hundred pupils had "practiced" drawing that year "one half with elementary instruction and the other half without." The report then continues as follows: "This art so improving, so elegant, and so practically useful and convenient in all the departments

of life, particularly in the mechanical or other industrial employments, should be taught more generally."

The report of 1850 indicates that drawing was taught in the higher schools by a Miss Crosby and in the primary schools by their respective teachers. Miss Crosby's services were discontinued after a few months because the Board thought all the drawing should be taught by the regular teachers. In order to meet the wishes of the Board the teachers took special lessons first of a Mr. Shattuck and then of Professor J. Brainerd to prepare themselves to teach drawing. The report of 1852 says,

> Professor Brainerd, actuated more by his love for the beautiful and useful of drawing, and by a desire to encourage its proper cultivation, than by the trifling compensation he has received, has afforded considerable instruction in the schools. His course is to familiarize youth with the principles of drawing both plane and perspective, so that they may sketch natural objects with freedom and accuracy, rather than to make them mere copyists of the drawings of other people, which last, although the most that is generally attempted in schools, is not drawing in any true or liberal sense. Not that the exercise of copying from books and cards is without its uses, particularly to primary scholars, with whom the principles of the art would be too abstruse for comprehension, but that in the higher departments certainly, a much more radical training should be had. (30—12)

At the request of the School Board, Professor Brainerd prepared a course of lessons which was published in "plain and cheap" form for use in the schools. (30—12) He was employed by the Board for "seven or more years continuously" with very satisfactory results, considering the amount of time devoted to this subject—one hour a week in the upper grades and a half hour in the lower grades. (31—103, 105)

There seems to be evidence that in making drawing an integral part of public school instruction Ohio was in advance of any state except Massachusetts and even in advance of that state in providing a special teacher and a paid supervisor.

SOURCE MATERIAL XI, A

Value of Instruction in Drawing

By Horace Mann

From Report of Secretary of State Board of Education in Massachusetts, 1843

In the course of my tour, I passed from countries where almost every pupil in every school could draw with ease, and most of them with no inconsiderable degree of beauty and expression, to those where less and less attention was paid to the subject; and, at last, to schools where drawing was not practiced at all; and, after many trials, I came to the conclusion, that, with no other guide than a mere inspection of the copy books of the pupils, I could tell whether drawing were taught in the school or not; so uniformly superior was the handwriting in those schools where drawing was taught in connection with it. On seeing this, I was reminded of that saying of Pestalozzi, somewhat too strong, that "without drawing there can be no writing."

But suppose it were otherwise, and that learning to draw retarded the acquisition of good penmanship, how richly would the learner be compensated for the sacrifice. Drawing, of itself, is an expressive and beautiful language. A few strokes of the pen or pencil will often represent to the eye what no amount of words, however well chosen, can communicate. For the master architect, for the engraver, the engineer, the pattern designer, the draughtsman, moulder, machine builder, or head mechanic of any kind, all acknowledge that this art is essential and indispensable. But there is no department of business or condition in life, where the accomplishment would not be of utility. Every man should be able to plot a field, to sketch a road or a river, to draw the outlines of a simple machine, a piece of household furniture, or a farming utensil, and to delineate the internal arrangement or construction of a house.

But to be able to represent by lines and shadows what no words can depict, is only a minor part of the benefit of learning to draw. The study of this art develops the talent of observing, even more than that of delineating. Although a man may have but comparatively few occasions to picture forth what he has observed, yet the power of observation should be cultivated by every rational being. The skillful delineator is not only able to describe far better what he has seen, but he sees twice as many things in the world as he would otherwise do. To one whose eyes have never been accustomed to mark the form, color or peculiarities of objects, all external nature is enveloped in a haze, which no sunshine, however bright, will ever dissipate. The light which dispels this obscurity must come from within. Teaching a child to draw, then, is the development in him of a new talent, the conferring upon him, as it were, of a new sense by means of which he is not only better enabled to attend to the common duties of life, and to be more serviceable to his fellow-men, but he is more likely to appreciate the beauties and magnificence of nature, which everywhere reflect the glories of the Creator into his soul. When accompanied by appropriate instruction of a moral and religious character, this accomplishment becomes a quickener to devotion.

With the inventive genius of our people, the art of drawing would be eminently useful. They would turn it to better account than any other people in the world. We now perform far the greater part of our labor by machinery. With the high wages prevalent amongst us, if such were not the case, our whole community would be impoverished. Whatever will advance the mechanic and manufacturing arts, therefore, is especially important here; and whatever is important for men to know, as men, should be learned by children in the schools.

But whatever may be said of the importance of this art, as it regards the community at large, its value to a school-teacher can hardly be estimated.

If the first exercises in reading were taught as they should be; if the squares of the multiplication table were first to be drawn on the blackboard, and then to be filled up by the pupils, as they should see on what reason the progressive increase of the numbers is founded; if geography were taught from the beginning, as it should be, by constant delineations upon the blackboard; then every teacher, even of the humblest school, ought to be acquainted with the art of linear drawing, and be able to form all the necessary figures and diagrams not only with correctness but with rapidity. But in teaching navigation, surveying, trigonometry, geometry, etc.; in describing the mechanical powers, in optics, in astronomy, in the various branches of natural philosophy, and especially in physiology, the teacher who has a command of this art, will teach incomparably better, and incomparably faster than if he were ignorant of it. I never saw a teacher in a German school make use of a ruler or any other mechanical aid, in drawing the most nice or complicated figures. I recollect no instance in which he was obliged to efface a part of a line because it was too long, or to extend it because it was too short. If squares or triangles were to be formed, they came out squares or triangles without any overlapping or deficiency. Here was not only much time gained, or saved, but the pupils had constantly before their eyes these examples of celerity and perfectness, as models for imitation. No one can doubt how much more correctly, as well as more rapidly, a child's mind will grow in view of such models of ease and accuracy, than if only slow, awkward, and clumsy movements are the patterns constantly held before it. (32—67, 68)

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CHRONOLOGICAL CHART

1600—1700

			PAGE
ENGLAND	1601	Poor Law—apprenticing paupers	267
	1605	Bacon—philosophy of realism	35
	1647	Petty—Proposed "Literary workhouse," advocated drawing	44
	1677	Moxon—began to publish *Mechanick Exercises*	51
	1693	Locke—*Some Thoughts Concerning Education*	61, 68
FRANCE	1648	French Academy of Painting and Sculpture founded	377
GERMANY	1632	Comenius—*Great Didactic* written (published 1849)	36, 65
	1657	Comenius—*Orbis Pictus*	36
	1694	Francke—Institute for orphans	75
	1699	Royal College of Art, established at Berlin	390
SWITZERLAND			
AMERICA	1630	The Franciscans—Industrial mission schools in New Mexico	73
	1642	Comprehensive apprenticeship law in Massachusetts	268
	1647	School ordered in every town of fifty householders in Massachusetts	269
	1685	Budd—Plan for public schools in Pennsylvania and New Jersey	62

CHRONOLOGICAL CHART

1700—1775

		Page
ENGLAND	1738–1779 Inventions that brought about the Industrial Revolution	271
	1755 Royal Society of Arts in London	382
	1768 Royal Academy opened in London	381
FRANCE	1747 *École des Ponts et Chaussées* opens in Paris	345
	1762 Rousseau—*Emile* published	77
	1766 Oberlin—Began his work at Waldbach	170
GERMANY	1739 Sunday School attendance compulsory in Würtemberg	287
	1747 Hecker—*Realschule* opened	76
	1765 Royal Saxon School of Mines organized at Freiberg	347
	1774 Basedow—Philanthropinum founded	84
	1774 Kinderman (in Bohemia)—Organized "Schools of Industry"	87
SWITZERLAND	1771 Pestalozzi—Industrial school experiment at Neuhof	110
AMERICA		

CHRONOLOGICAL CHART

1775—1800

			Page
ENGLAND	1776	Smith—advocated education of apprentices	270
	1788	Philanthropic Society—Industrial Reform School	219
	1791	"Schools of Industry" in England	88
	1796	Report of Manchester Board of Health	171
	1798	Adult school opened in Nottingham	301
	1799	Owen—Began social reform at New Lanark	172
FRANCE	1791	Constituent Assembly abolished the gilds	275
	1795	*École Polytechnique* opened in Paris	346
	1795	National Institute of France established	379
	1799	First National School of Arts and Trades	276
GERMANY	1784	Salzmann—Opened school at Schnepfenthal	85
	1794	Compulsory school attendance	238
	1799	Niemeyer—Recommended the manual arts	159
	1799	Heusinger—*Die Familie Wrentheim* published	158
	1799	Royal Architectural Academy at Charlottenburg	347
SWITZERLAND	1798	Pestalozzi—School for orphans at Stanz	115
	1799	Fellenberg purchased Hofwyl	130
AMERICA	1778	Moravians—Industrial work and school work at Bethlehem, Pennsylvania	91
	1787	Cokesbury College, Maryland—gardening and carpentry	92
	1787	*Columbian Magazine*—Article on agricultural school	93
	1797	De la Howe will provides for agricultural school	94

CHRONOLOGICAL CHART

1800—1810

		Page
ENGLAND	1800 Birkbeck—Beginning of Mechanics' Institute Movement	302
	1802 First Factory Act	171
FRANCE		
GERMANY	1800–1802 Blasche—*Die Werkstätte der Kinder* published	86
	1803 Sunday School attendance compulsory in Bavaria	287
SWITZERLAND	1804–1824 Pestalozzi—Institute at Yverdun	118, 131
	1807 Fellenberg Academy built at Hofwyl	132
	1807 Fellenberg—Farm and Trade School under Wehrli	135
AMERICA	1805 Pennsylvania Academy of Fine Arts was formed in Philadelphia	394
	1807 Boston Athenæum organized	403
	1808 American Academy of Fine Arts in New York City	398

CHRONOLOGICAL CHART

1810—1820

	Year	Event	Page
ENGLAND	1814	Compulsory apprenticeship abolished	272
	1816	Owen—Opened infant school at New Lanark	172
	1819	Pounds—Ragged School at Portsmouth	223
FRANCE			
GERMANY	1818	Falk—Industrial School for Orphans	211
SWITZERLAND			
AMERICA	1810	Society of Artists formed in Philadelphia	396
	1814	First power loom used in America	272
	1814	Farm and Trade School, Boston	242

CHRONOLOGICAL CHART

1820—1830

		Page
ENGLAND	1824 London Mechanics Institute opened	305
FRANCE	1829 *École Centrale des Arts and Manufactures* in Paris	346
GERMANY	1826 Froebel—Wrote *The Education of Man*	163
SWITZERLAND	1827 Fellenberg's colony at Meykirch	143
AMERICA	1820 "Mechanics' School" opened in New York	317
	1821 Fowle taught drawing in a public school in Boston	416
	1822 Smith's *Juvenile Drawing Book*, published in New York	407
	1823 Gardiner Lyceum opened	348
	1824 New York House of Refuge opened	246
	1824 Franklin Institute incorporated in Philadelphia	319
	1824 Rensselaer School founded at Troy, New York	350
	1825 Owen—School at New Harmony, Indiana	176
	1825 Manual Labor at Maine Wesleyan Seminary	184
	1826 National Academy of Design formed in New York City	399
	1826 Manual Labor begun at Andover	183
	1826 Franklin Institute opens a high school	320
	1826 Holbrook issues plan for American Lyceum	326
	1827 Fowle translated Francoeur's book on drawing	416
	1827 Oneida Institute opened at Whitesborough, N. Y.	186
	1828 Ohio Mechanics' Institute opened in Cincinnati	325

CHRONOLOGICAL CHART

1830—1840

		Page
ENGLAND	1830 House of Commons appointed committee on art education	383
	1833 First public grant for elementary education	230
	1833 Factory Act—half-time schools for factory children	274
	1837 Government School of Design opened in London	385
	1839 Kay—Discussion of Pauper Schools	250
FRANCE	1839 Demetz—Industrial Reform School at Mettray	218
GERMANY	1833 Wichern—Redemption Institute opened at Horn	217
	1837 Froebel—Opened the first Kindergarten	163
	1837 Drawing in elementary schools	241
	1839 Law relating to factory children	260
SWITZERLAND	1833 Wehrli—Becomes principal of Normal School at Kreuitzlinger	167
AMERICA	1830 Woodbridge—Published "Sketches of Holwyl"	183
	1831 National Convention of Lyceums in New York City	328
	1831 Society for Promoting Manual Labor	189
	1834 Alcott—Opened Temple School in Boston	180
	1835 First civil engineers graduated at Rensselaer School	353
	1836–1838 Bache studies schools in Europe	213

CHRONOLOGICAL CHART

1840—1850

	Year	Event	Page
ENGLAND	1840	Government provided funds for schools of design in the large towns	386
	1842	Bayley—People's College at Sheffield	310
	1844	Ashley—Ragged School Union formed	224
	1849	Red Hill Farm School opened	220
FRANCE	1841	Law regulating labor of factory children	278
GERMANY	1848	Free public elementary schools	239
SWITZERLAND			
AMERICA	1840	Peale began to teach drawing in the Philadelphia High School	432
	1845	Minifie started drawing in the Baltimore High School	433
	1847	Drawing taught in all grades above the second in the Cincinnati schools	436
	1847	Shattuck taught drawing in Cincinnati high school	436
	1848	Girard College for orphans opened	243
	1849	Minifie's *A Textbook of Geometrical Drawing* published	433

CHRONOLOGICAL CHART

1850—1860

		Page
ENGLAND	1850 Government inspector's report on needlework	254
	1851 World's Fair in London	386
	1852 Training teachers became the main purpose of the Government School of Design	389
	1854 Ruskin—teacher of drawing in Working Men's College	314
	1854 Maurice—Working Men's College opened in London	313
	1854 "Certified Industrial Schools"	230
	1859 Norris—Discusses girls' industrial training	257
FRANCE		
GERMANY	1853 Law regulating labor of children in factories	287
	1855 Royal School of Art Industry in Munich	391
SWITZERLAND		
AMERICA	1850 Drawing taught in higher schools in Cleveland	439
	1850 Turner—Griggsville address on an industrial university	355
	1852 Turner—National land grant for universities proposed	357
	1853 Bartholomew, first teacher of drawing in Girls' High and Normal School, Boston	421

CHRONOLOGICAL CHART

1860—1870

		PAGE
ENGLAND	1870 Compulsory school attendance	238
FRANCE	1865 Report of Commission on Technical Education	278
	1865 Commission discusses educational value of shopwork	280, 283
	1865 Commission advocates drawing	284
GERMANY	1869 "Regulation of industry" act—compulsory continuation school attendance	289
SWITZERLAND		
AMERICA	1862 Land-Grant Act signed by President Lincoln	358
	1867 Wines—Survey of juvenile reformatories	249
	1868 Drawing required subject in all grades of Cincinnati schools	437
	1868 Washburn Shops opened at the new technical school at Worcester	360
	1868 Complete graded system of drawing in Boston public schools	422
	1868 Armstrong—Hampton Institute opened	245
	1868 Forbriger employed as full-time drawing supervisor in Cincinnati	438
	1870 Metropolitan Museum of Art in New York City	402

INDEX

Agricultural college, earliest plan for, in England, 41
Agricultural colleges established in America, 358
Agricultural instruction: at New Harmony, 178; proposed by Dr. Benjamin Rush, 93
Agricultural school: Fellenberg's, 135–140; the first in America, 94; of Pestalozzi, 110; proposed in article in *Columbian Magazine*—1787, 93–100
Agricultural schools, the Wehrli, 169
Agriculture: Fellenberg's estimate of its value in education, 137; as viewed by Rousseau, 80
Alcott, Amos Bronson, 179
Alcott's Temple school in Boston, 180
Allston, Washington, 397, 403, 405
Alphabet: of abilities suggested by Pestalozzi, 122; of form, Pestalozzi's, 120
Apprentice: pauper children in England, 267; training, value of instruction shops in, 280
Apprentices: education of, in colonial America, 267; orphans bound out as, 215; schooling for, in Massachusetts, 269
Apprenticeship: the chief educational institution for middle-class youth, 21; as education 26; effect of factory system upon, 270; in the Middle Ages, 25; purpose sometimes general education, 267; school substitutes for, 266; seeking substitute for in France, 275
Architectural drawing, the oldest, 20
Art: development of, in Boston, 402; early development in New York, 397; early development in Philadelphia, 391
Art industries encouraged in France, 376
Art instruction in Charleston, 404; in Cincinnati, 406; in Germany, 390; policy of France, 376
Art schools, early in Great Britain, 379; early in Italy, 374
Art training, established in England, 383
Armstrong, Samuel Chapman, 244
Ashley, Lord (Anthony Ashley Cooper), 224, 273

Babylonian Code of Hammurabi, 13
Bache, Alexander Dallas, 213, 215, 290
Bacon's philosophy of realism, 34
Barnard, Henry, 421
Bartholomew, William Newton, 421
Basedow, Johann Bernhard, 82
Bayley, Rev. R. S., 310
Benedict, Saint, rule of, 4
Benedictines, labor required by, 17
Birkbeck, Dr. George, 302
Birkbeck's first lectures to mechanics, 302
Blackburn, Jonathan, 402
Blake, William, 214
Blasche, Bernhard Heinrich, 84
Blue-Coat School, London, 216
Bookmaking, manuscript, 18
Booth, Rev. J., 332
Boston Athenæum, 402
Boynton, John, 360
Brainerd, Professor J., 439
Brougham, Henry, Lord, 151, 303, 330
Bryan, Rev. F. J., 225
Budd, Thomas, his plan for public schools in America, 62
Buss, Johannes, 120; methods of teaching drawing, 124, 125

Campe, Joachim Heinrich, 84
Carpentry recommended by Niemeyer, 159
Cassiodorus, 19
"Certified industrial schools" in England, 230
Child labor regulations in Germany, 287

Claypoole, James, 393
Clinton, DeWitt, 318, 398
Cokesbury College, 92
Columbian Magazine, article in, proposing agricultural schools, 93
Comenius: advocates teaching according to the order of nature and the arts, 36; method of the arts, 39, 65; teaches drawing in fourth or fifth year, 37
Committee of Council on Education, 231, 388
Compulsory school attendance in Germany, 238
Continuation schools of Germany, 287
Cooper Union, 400
Copley, John Singleton, 402
Cornelius, Rev. Elias, 183
Craig, Dr. John D., 325

Demcker, Robert, 438
Demetz, M., 218
Department of Science and Art, 387
Department of Practical Art, 387, 389
Design: English, at Paris Exposition of 1867, 388; school of, at Marlborough House, 389; school of, at Somerset House, 388
Designs from France used by English manufacturers, 384
Dickens, Charles, 273
Dickinson, Lowes, 316
Domestic duties in Fellenberg's school for girls, 139
Drawing: advocated by Sir Wm. Petty, 45; Bartholomew's drawing books, 422; in Boston public schools, 415; in Central School, Lyons, France, 285; in Cincinnati public schools, 433; in Cleveland public schools, 438; course of instruction in School of Design, England, 386; early courses for general education in America, 407; early course taught in Cincinnati, 436; early instruction book by Fowle, 416; educational value of emphasized by Mulcaster, 33; evening school in Boston, 431; first American public school supervisor of, 437; French copy books of 1860, 286; in French schools of industrial training, 284; in German elementary schools, 240; instruction in Germany, 291; instruction at Nuremberg, 292; methods in Alcott's school, 181; methods of teaching, 422; Minifie's *Textbook of Geometrical Drawing*, 433; Ruskin, teacher of, at Workingmen's College, London, 314; "Schmidt's method," 241; in school at Franklin Institute, 321; Smith's *Juvenile Drawing Book*, 407; as taught by Buss in Pestalozzi's school, 120, 124, 125; taught in Baltimore high school, 433; taught by Comenius, 37; taught at Heriot's Hospital, 216; taught in Philadelphia high school. 432; taught in village schools of Bavaria, 384; value of, in general education, 408; value of instruction in, 440

Eaton, Amos, 351
Education: of factory children in Germany, 260; new conception of the process, 30; of the working classes in Europe, 262
Education of Man, Froebel's, 163
Emile, Rousseau's, 77

Factories, child labor in, 278
Factory school regulations in Baden, 239
Factory schools in Germany, regulation of, 260
Factory system and its effect upon apprenticeship, 270; early example among Greeks, 16
Falk, John Daniel, 210
Farm School, Red Hill, 220
Farm and trade school, Fellenberg's, 135
Fellenberg, Philip Emanuel von, 128
Fellenberg's academy, 132; farm and trade school, 135; institution at Hofwyl, 130, 147, 151, 154; normal school, 141; school colony at Meykirch, 143; school for girls, 139; school of applied science, 140; theory of educational reform, 129
Fontainbleau, Gobelein factory at, 377
Forbriger, Arthur, 437
Fowle, William Bentley, 416

France, higher technical schools in, 345
Franciscan Schools: in California, 74; of New Mexico, 73
Francke, August Hermann, 75
Francke's school for orphans, 75
Franklin Institute: journal of the, 324; of Philadelphia, 319; school, forerunner of public high school, 320
Fraser, Charles, 404
French Academy of Painting and Sculpture, 377
French Commission of 1865, 278
Froebel, Friedrich Wilhelm Augustus, 161
Fuller, Sarah Margaret, 180
Fulton, Robert, 395
Furnivall, Frederick James, 312

Gale, Rev. George W., 186, 189, 203
Gardening, recommended by Locke, 69
Gardiner Lyceum, 363; course of instruction, 349; first scientific and technical school in America of college grade, 348
General Society of Mechanics and Tradesmen, New York, 317
Gilds: abolished in France in 1791, 275; the beginning of, 12; in England, destroyed by factory system, 271
Girard College, 243
Gobelein tapestry factory, 377
Graeter, Francis, 181
Greek attitude toward mechanical arts, 15
Griscom, John, writings of, 147, 173, 219
Guthrie, Dr. Thomas, 222

Hale, Benjamin, 348
Half-time schools: advantages and disadvantages, 293–295; in England, 272
Hampton Normal and Industrial Institute, 245
Hands, trust in their, 23
Handwork, Froebel's estimate of, 164
Handy-works, doctrine of, Moxon's treatise on, 32
Hartlib, Samuel, 39
Hartlib's plan for a college of agriculture, 41
Haydon, Benjamin Robert, 385
Healey, George Peter Alexander, 403
Hecker, Johann Julius, 76
Herbart, Johann Friedrich, 160
Herbart's view of handwork, 161
Hesselins, Gustavus, 392
Heusinger, Heinrich Gottlieb, 158
Heusinger's rules for instruction in manual work, 159
Higgins, Milton P., 362
Hodgskin, Thomas, 304
Hofwyl, 128, 130
Holbrook, Josiah, 326
House of Refuge, Randall's Island, New York, 246
Howe, Dr. John de la, 94
Hudson, J. W., 335
Hughes, Thomas, 312
Hunt, William Morris, 403

Imitation: barbaric peoples learn manual arts through conscious, 12; learns handwork by unconscious, 11
Industrial art training in Great Britain, 383
Industrial reform school, the first in America, 246
Industrial reform schools, 216; in America, 246
Industrial schools: certified, 230; for orphans and poor children in America, 242; for poor or delinquent children, 210
Industrial training in English reform schools, 219
Industrial training: for girls, 257; for girls in Massachusetts, 269; at Hampton Institute, 245; in mission schools in California, 74; in mission schools in New Mexico, 73; for orphans, 76; proposed by Budd, 63; in ragged schools, 226; at Redemption Institute, Germany, 218; reformative value of, 233
Industrial work: in English elementary schools, 233; kinds of, done in juvenile reformatories, 249; result of Pestalozzi's experiment in, 112–123; value of, in prisons, 247; in *Volkschule* under Kindermann, 87
Industries taught: at New Harmony,

178; in Moravian schools of Pennsylvania, 91; in schools of industry, 89; under Kindermann, 87
Infant school: first in England, 172; at New Harmony, 176; Oberlin's, 170 (see *Kindergarten*)
Instruction shops, French, purposes of, 280

Jews: ancient, recognized social value of handwork, 13; regarded labor as religious duty, 14
Johnson, W. R., 320
Joinery, recommended by Locke, 69
Jones, Thomas P., 324

Kay, James Phillips, writings of, 193, 236, 250
Kay, Joseph, writings of, 169, 170, 193, 239, 260
Keller, Sir Godfrey, 380
Kindergarten, the first, 163 (see Infant school)
Kindermann, Ferdinand, 86
Kindermann's estimate of Francke's institution, 87
King's College, London, 312
Kingsley, Charles, 311
Kynaston, Sir Francis, 380

Labor, dignity of, 14; division of, early example among Greeks, 16; a fetish among early Christian monks, 17; religious duty, 14 (see Manual labor)
Land-Grant Act of 1862, 353; passed, 358
Laws: Babylon, 2250 B. C., Code of Hammurabi, 13; England,—1562, statute of artificers, 267; 1601, poor law, 267; 1802, Factory Act, 272; 1814, abolishing compulsory apprenticeship, 272; 1833, Factory Act, 274; 1844, Factory Act, 274; 1857, "certified industrial schools," 232; 1866, Industrial School Act, 232; France,—1791, abolished the gilds, 275; 1803, apprentice contract, 275; 1834, education of children, 263; 1841, child labor in factories, 278; Germany,— 1869, "Regulation of Industry," 289; Massachusetts Bay Colony, 1642, ability to read, 268; Massachusetts,—1647, free schools and compulsory attendance, 269; 1870, drawing in public schools, 430; Plymouth Colony,—1641, poor law, 268; 1671, ability to read and training for occupation, 268; Prussia,—1853, age of children working in factories, 287
Leonard and Gertrude, Pestalozzi's, 115
Leslie, Charles Robert, 397
Livingston, Robert R., 397
Locke, John, 60; includes the manual arts in his scheme of education, 60
Luther, Martin, advocated state-supported schools, 30
Lyceum, American, 326; Holbrook's announcement of, 340
Lyceum Movement, the, 325

Machine shop equipment in technical school at Mulhouse, 298
Maclure, William, 174
Malbone, Edward G., 404
Mann, Horace, 421, 440
Manual arts: advocated by Locke, 60; a basis for intellectual improvement, 86; connected with study by Pestalozzi, 116; Heusinger's rules, 159; instruction proposed by Dr. Benjamin Rush, 93; Locke's estimate of, 68; a means of mental training, 81; at New Harmony, 178; recognition of general educational value in France, 283; recommended by Niemeyer, 159; Rousseau's estimate of the value of, 96; suggested by Sir William Petty, 46; taught by Planta, 86; term used by Bacon in 1605, 35; under Salzmann, 85
Manual labor: at Cokesbury College, 92: on the farm, 185; in Fellenberg's academy, 134; plan of an academy, 206; required by the Benedictines, 17
Manual Labor Movement: in America, 182; reasons for decline of, 192
Manual labor school, one employing skilled teacher of woodworking, 205
Manual labor shop at Andover, 184
Manual labor, society for promoting in literary institutions, 189
Manual labor system: difficulties

involved, 191; arguments for, 191
Manual Trade, Locke recommends, 68
Manual Trades close to the necessities of life, 11
Manual training, 177
Maryland Institute, Baltimore, 324
Maurice, Frederick Denison, 311
Mechanic arts: value of, in school of engineering, 361
Mechanical arts: as viewed by Rousseau, 80; attitude of Greeks toward, 15
Mechanical drawing, early American course, 417
Mechanical perspective, problems in, 418
Mechanics' Institute: Boston, 324; Cincinnati, 324; origin of, in London, 304 (see New York Society of Mechanics and Tradesmen and Franklin Institute)
Mechanics' Institute Movement: in Great Britain, 301; reasons for decline, 306; results in America, 328; service rendered to education, 308, 332, 335
Mechanics' Institutes: early development of, in England, 306, 330; in America, 317
Mechanics' Magazine, 304, 307
Methodenbuch by Basedow, 83
Millbury Lyceum, 327
Milton, John, would have learning delightful to young minds, 41
Minifie, William, 433
Minifie's *Textbook of Geometrical Drawing*, 433
Monasteries, centers of intellectual life, 21
Monastic Schools, curriculum of, 20
Monks, early Christian, labor among, 17
Monteith, Rev. John, 187, 205
Moravians, industrial training of, in Pennsylvania, 91
Morrill, Justin S., 357
Morse, Samuel Finley Breese, 398
Moxon, Joseph, 51
Moxon's treatise on mechanical processes, 51
Mulcaster, Richard, 33
Mulcaster, made drawing a fundamental study, 33
Mulhouse, France, Technical School at, 296
Museum, Albert and Victoria, South Kensington, 387
Museum of Art, Metropolitan, New York, 401
Museum restrictions in Philadelphia, 395, 396

National Academy of Design, New York, 399
National Art Training School, England, 389
National school of arts and trades, the first in France, 276
Needlework in England, 254
Neef, Joseph, 176, 178
New Harmony, Indiana, 174
Niemeyer, Augustus Hermann, 159
Niemeyer recommended the manual arts, 159
Noble, T. S., 406
Norris, Rev. J. P., writings of, 257

Oberlin, John Frederick, 170
Ohio Mechanics' Institute, lectures at, 325
Oneida Institute of Science and Industry, 203
Orbis Pistus, 36, 83
Orphan School—Girard College, 243
Orphans: earliest school for, 75; industrial schools for, in Germany, 210; Pestalozzi's school at Stanz, 115; schools for, in Great Britain, 214
Owen, Robert, 171
Owen, Robert Dale, 132, 154
Owen's: educational experiment at New Harmony, 174; higher school, 173; infant school at New Lanark, 172

Paris, an art center, 377
Paris Exposition of 1867, 388
Pauper schools in England, 250
Peabody, Elizabeth Palmer, 180
Peale, Charles Willson, 393
Peale, Rembrandt, 431
Peale's, *Graphics*, 432
Pennsylvania Academy of Fine Arts, 394
Pennsylvania: industrial training in

Moravian schools of, 91; Thomas Budds plan for public schools in, 62
People's College, 310
Pestalozzi, Johann Heinrich, 106; influenced by Rousseau, 108
Pestalozzian methods, 118
Pestalozzi's alphabet of form, 120; experiment at Neuhof, 110; institute at Yverdun, 118; school at Burgdorf, 116; school for orphans at Stanz, 115
Petty, Sir William, advocated "Book of Trades," 46; suggests a "literary work-house," 44; would connect handwork with the school, 47
Philanthropic Society, London, 220
Philanthropinum at Schnepfenthal, 84
Philbrick, John Dudley, 421
Pictures, use of in teaching, 36, 83, 119
Planta, Martin, 86
Playfair, Sir Lyon, 291
Pounds, John, 223
Pratt, Matthew, 393
Printing in a school for general education, 237
Public School Society, New York, 318

Rabelais, the influence of, 31
Ragged school; the first, 23
Ragged School Union, 224
Ragged schools of England, 222
Realschule, the, 76
Rensselaer Polytechnic Institute, 350; afternoon amusements, 352; first engineering college in America, 353; first graduate school in America, 352
Reynolds, Sir Joshua, 381
Robertson, Joseph Clinton, 304
Rossetti, Dante Gabriel, 316
Rousseau, Jean Jacques, 77
Royal Academy, London, 381
Royal Society of Arts, London, 382
Royal Society of London, aims of, 48
Rule of St. Benedict, 17, 24
Rural schools, training teachers for, 167
Rush, Dr. Benjamin, proposes instruction in manual arts and agriculture, 93
Rush, William, 393
Ruskin, John, 314

Saint Luke, Society of, 375, 376
Salzmann, Christian Gotthilf, 85
School colony of Fellenberg's at Meykirch, 143
School of Industry, the, 86; the development of in Germany, 88; in England, 88; the, in France, 90
Schoolroom decoration, 182
School workshop, value of, in technical training, 282
Schools of Applied Science in America, 348
Scriptorium, 19
Self-activity, Froebel's doctrine of, 161
Sèvres, porcelain factory at, 378
Sewing: in English schools, 254; in Fellenberg's school for girls, 139; in German schools, 241; in Massachusetts, 269
Sewing and industrial work in English schools for girls, 257
Shaftsbury, Lord, 273
Shattuck, W. B., 436
Shipley, William, 382
Shopwork: general educational value of, recognized in France, 283
Shopwork instruction: in German schools, 289; in technical school at Mulhouse, 296
Silliman, Benjamin, 326
Skill of hand a source of power, 11
Slater's cotton mill, 272
Smith, Adam, 270
Smith, John Rubens, 407
Smybert, John, 392
Society of Artists, Philadelphia, 396
South Carolina, De la Howe State School, 95
Stowe, Calvin, 241, 433
Stuart, Gilbert, 393
Sully, Thomas, 393
Sunday Schools, 301

Talmud, teaching of trade required by, 13
Teacher training: in Fellenberg's institution, 142: in industrial art, England, 388; for rural schools, 167
Teachers, volunteer, in ragged schools, 229
Teaching according to nature, Rousseau's idea of, 79
Teaching drawing: at Working-

men's College, London, 316; in Pestalozzi's school, 124, 125
Teaching methods of Wehrli, 137
Teaching by use of objects, Pestalozzi's method, 119
Technical Schools: in Germany and Austria, 347; of France, 345
Technical training, school workshop in, 282
Thompson, Charles O., 361
Thornhill, Sir James, 380
Tours, center of art and industry, 376
Trade, Emile to learn a, 80
Trade-learning at home, 13, 31
Trade of joiner, Emile to learn, 81, 99
Trade school, Fellenberg's, 135
Trade schools, France, 276
Trades, Budd's plan for teaching, 63
Trades taught: in first national school of arts and trades of France, 277; at Hampton Institute, 246; at Hofwyl, 137
Trumbull, John, 393, 403
Turner, Jonathan Baldwin, 355
Turner's Griggsville address, 355, 366
Turner, Sidney, 220

University, an industrial, Turner's Griggsville address, 366

Van Rensselaer, Stephen, 328
Volkschule, industrial work, in 87

Washburn, Ichabod, 360
Watson, John, 392
Wehrli, Johann Jakob, 135, 166
Wehrli: agricultural schools, 169; first teacher in Fellenberg's farm and trade school, 135
Wehrli's normal school at Kreuitzlingen, 166, 193
Weigel, Erhard, 72
Weld, Theodore D., 189, 192
West, Benjamin, 393
Whitcomb, David, 360
Wichern, T. H., 217
Wilder, Marshall P., 354
Wines, E. C., 249
Wood, William, 317
Woodbridge, William C., editor of *Annals of Education*, 129, 130, 135, 139, 144, 183
Woodworking in manual labor school, 205
Worcester Polytechnic Institute, 360
Workingmen's College: in London, 313
Workingmen's Colleges in England, 309; the spirit of, 337
Workshop in the school of engineering, 358
Workshop practice, reasons for in school of engineering, 361
World's Fair, London—1851, 386

Xenophon, 16